

THE ATHENÆUM

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No. 1614.

LONDON, SATURDAY, OCTOBER 2, 1858.

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UNIVERSITY OF LONDON.

CONVOCAATION.
A MEETING OF CONVOCAATION is hereby convened, to be held at Burlington House, on WEDNESDAY, Nov. 10, at One o'clock p.m., to nominate a list of three persons for the purpose of being submitted to Her Majesty for selection therefrom of a Fellow of the University.
Members of Convocation desirous of proposing Candidates are requested to forward their Nominations to the Registrar on or before Wednesday, Oct. 27th, in order that they may be included in the Circular and Voting-paper which will then be issued.
The following graduates are qualified as Members of Convocation: namely, all Doctors of Laws, Doctors of Medicine, and Masters of Arts, all Bachelors of Laws and Bachelors of Medicine of two years standing, and all Bachelors of Arts of three years standing.

By order of the Senate.
WILLIAM R. CARPENTER, M.D., Registrar.
Burlington House, W.
September 25, 1858.

UNIVERSITY OF LONDON.

CONVOCAATION.
NOTICE IS HEREBY GIVEN, That the ADJOURNED MEETING OF CONVOCAATION will be held at Burlington House, on WEDNESDAY, Nov. 10, at One o'clock p.m., when the new Regulations of the Senate respecting Degrees will be communicated and the following business will be brought forward—

The Report of the Committee on the 4th of May;
The appointment of a Clerk of Convocation;
The nomination of three persons for one of the vacant Fellowships.

Members of Convocation not receiving the Report of the Committee are requested to apply for it to Mr. Moore at Burlington House.

Members desirous of proposing a Candidate for the Clerkship are requested to forward their Nomination to the Chairman of Convocation on or before Wednesday, Oct. 27th, in order that it may be included in the Circular and Voting-paper which will then be issued.

Members desirous of bringing forward any business are requested to give notice to the Chairman on or before the same date in order that it may be included in the Circular.

CHARLES JAMES FOSTER, LL.D., Chairman of Convocation.
Burlington House, W.
September 25, 1858.

UNIVERSITY COLLEGE, LONDON.

COURSES OF INSTRUCTION IN THE COLLEGE AND JUNIOR SCHOOL applicable to the Examinations of Her Majesty's Civil Service, the Civil Service of India, Admission to the Royal Military College, Sandhurst, Admission to the Royal Military Academy at Woolwich, Commissions in the Army, and for Admission to the Staff College at Sandhurst.

A Special Prospectus of these Courses compared with the requirements for the respective Examinations, together with Copies of the Regulations for the respective Examinations, may be had on application at the College.

THE FACULTY OF ARTS OF THE COLLEGE will OPEN for the Session on WEDNESDAY the 13th of October.

THE JUNIOR SCHOOL has JUST COMMENCED.

CHAR. C. ATKINSON, Secretary to the Council.
September 25, 1858.

MINERALOGY.—KING'S COLLEGE,

LONDON.—PROF. TENNANT, F.R.S., will commence a COURSE OF LECTURES ON MINERALOGY, with a View to facilitate the Study of GEOLOGY, and of the Application of Mineral Substances in the ARTS. The Lectures will be illustrated by an extensive Collection of Specimens, and will begin on FRIDAY, October 24th, Nine o'clock. They will be continued on each succeeding Wednesday and Friday, at the same hour. Fee 2s. 2d.

R. W. JELF, D.D., Principal.

COLLINS has received your money.

The New School as such is no more. The Principal of the Old School has been your almoner. Where can a letter reach you?

UNIVERSITY OF ST. ANDREWS.

UNITED COLLEGE OF ST. SALVATOR AND ST. LEONARD.

THE CLASSES in this College will OPEN on THURSDAY the 4th of November, at 12 o'clock, when Principal SIR DAVID BREWSTER will deliver an INTRODUCTORY ADDRESS.

SIR DAVID BREWSTER, K.H. &c. &c. Principal.

Professors.
Latin—J. C. Shairp, A.A. Oxon. Assistant to W. Pyper, LL.D.
Greek—W. Y. Sellar, A.A. Oxon. Assistant to Andrew Alexander, LL.D.

Mathematics—J. Couch Adams, M.A. Cantab. F.R.S.
Logic and Rhetoric—W. Spalding, M.A.

Moral Philosophy and Natural Philosophy—J. F. Ferrier, LL.D.
Experimental Physics and Natural Philosophy—W. L. F. Fisher, M.A. Cantab. F.R.S.

Chemistry—M. Foster, M.D. Assistant to Arthur Connell, F.R.S.S.L. &c.
Human and Comparative Anatomy and Physiology—G. E. Day, M.D. F.R.S.

Civil History—W. Macdonald, M.D. F.R.S.E.

DIVINITY OR ST. MARY'S COLLEGE.

THE CLASSES will OPEN on THURSDAY, the 18th of November.

The Very Rev. JOHN TULLOCH, D.D. Principal.

Professors.
Principal and Primarius Professor of Divinity—John Tulloch, D.D.

Second Master and Professor of Divinity—William Brown, D.D.
Ecclesiastical History—George Bain, D.D.

Oriental Languages—A. F. Mitchell, A.M.

A considerable number of Bursaries, tenable for four years, are attached to both Colleges, and are open to competition; and Prizes are awarded in each of the Classes at the end of the Session.

Some of the Professors receive Students to reside with them, and the Secretaries can afford information regarding Board, Lodgings, or any other matter connected with the Colleges.

W. F. IRELAND, Secretary to the United College.

STUART GRACE, Secretary to St. Mary's College.

St. Andrews, September 2, 1858.

LADIES' COLLEGE, 47, BEDFORD-SQUARE.

RICHARD H. HUTTON, M.A., London, will deliver a LECTURE, introductory to the Session, on 'The Relative Value of Studies and Accomplishments in the Education of Women,' at Three o'clock, on TUESDAY, the 13th inst. Open to Ladies and Gentlemen.
The CLASSES will BEGIN on THURSDAY, October 14th. Information can be obtained from the Lady Resident at the College daily.
JANE MARTINEAU, Hon. Sec.

DENMARK-HILL GRAMMAR SCHOOL,

near London.—Principal, Mr. C. P. MASON, B.A., Fellow of University College, London. The object aimed at in this School is to furnish a thorough and systematic education, based upon moral and religious principles, the acquisition of superficial knowledge for the purpose of ostentation being sedulously discountenanced. The course of study pursued admits of partial modification to suit the particular requirements of Pupils who may be preparing for any of the liberal Professions, for Mercantile pursuits, or for special Examination in connection with the Civil or Military Services. For one indication of the success with which the objects aimed at are realized, attention is invited to the results of the recent Oxford Examinations, as published by the University. School duties will be resumed after the Michaelmas holidays, on Thursday, October 7.—Prospectus may be obtained on application to the Principal, or to Messrs. Hefle Brothers, School Book-sellers, 130, Aldersgate-street, London.

QUEENWOOD COLLEGE,

Near STOCKBRIDGE, HANTS,
DUNBRIDGE STATION, SALISBURY BRANCH, S.W.R.
GEORGE EDMONDSON—Principal.

Natural Philosophy and Mathematics—Fred. R. Smith, LL.D.
Chemistry—Dr. Henry Debus, late Assistant in the Laboratory of Prof. Bunsen, and Chemical Lecturer in the University of Marburg.
Classics and History—Daniel Hughes, M.A. Jesus Coll. Oxford.

Modern Languages and Foreign Literature—Mr. John Haas, from M. de Fellenberg's Institution, Hofwil, Switzerland.
German—Mr. Nicholas Weismüller, from M. de Fellenberg's Institution, Hofwil, Switzerland.
Practical Surveying, Levelling, &c.—Mr. Richard P. Wright.
Drawing—Mr. Richard P. Wright.
English—Mr. Daniel R. Brightwell.
Reading—Mr. William Trevor.
Music—Mr. William Cornwall.

TERMS.

For Boys under twelve years of age..... 52s. per annum.
" above twelve and under fifteen..... 52s. " " " above fifteen..... 62s. "

Laundress and Semstress 2s. per annum extra (except in the case of two or more Pupils from the same family, when this charge is omitted).

NEW COLLEGE.

THE CLASSES for the ensuing WINTER will MEET upon WEDNESDAY the 10th November next. The INTRODUCTORY LECTURE will be delivered by

The Rev. WILLIAM CUNNINGHAM, D.D., Principal, on TUESDAY, the 9th November, at Two o'clock.

THE CLASSES for the different Branches of Study will be OPENED as follows:—

Classes.	Days and Hours of Attendance.	Professors.
Divinity.	Junior Class Wed. Nov. 10, eleven o'clock.	Dr. Buchanan, 51, Lauriston-place.
	Senior Class Ditto, one o'clock.	
Divinity.	Junior Class Wed. Nov. 10, eleven o'clock.	Dr. Bannerman, 7, Clarendon-crescent.
	Senior Class Ditto, one o'clock.	
Divinity and Church History.	Junior Class Wed. Nov. 10, one o'clock.	Dr. Cunningham, 17, Salisbury-road.
	Senior Class Ditto, eleven o'clock.	
Hebrew and Oriental Languages.	Junior Class Wed. Nov. 10, ten o'clock.	Dr. Duncan, 29, Elder-street.
	Senior Class Ditto, twelve o'clock.	
Exegetical Theology.	Junior Class Wed. Nov. 10, ten o'clock.	Professor Munton, Lennox-street, Easton-terrace.
	Senior Class Ditto, twelve o'clock.	
* Natural Science.	Wed. Nov. 10, twelve o'clock.

According to these arrangements, the Curriculum for Students of Theology will stand thus:—

First Year's Students	Attend Dr. Buchanan's Junior Class at ten, Dr. Bannerman's ditto at eleven, Natural Science Class at twelve.
Second Year's Students	Attend Dr. Buchanan's Junior Class at eleven, Dr. Duncan's Senior ditto at twelve, Dr. Cunningham's Junior ditto at one.
Third Year's Students	Attend Prof. Munton's Junior Class at ten, Dr. Cunningham's Senior ditto at eleven, Dr. Buchanan's ditto at one.
Fourth Year's Students	Attend Prof. Munton's Senior Class at twelve, Dr. Bannerman's ditto at one.

MATRICULATION.

Students of Theology, before entering with the Professors, must Matriculate in the Library, and pay the common Fee to the Librarian.

NATURAL SCIENCE.

* This Class is recognized as equivalent to any of the Classes of Natural History in the Universities of Scotland, by the Royal College of Surgeons, Edinburgh, and by the Army and Navy Medical Boards, London. There is attached to it a Class Library, containing upwards of 250 volumes on Natural Science, the valuable gift of a Lady. By the orders of the Lords of the Committee of Privy Council for Trade, &c., the Ticket of this Class gives free admission at all times to the Public Museum of the University.

JAMES BONAR, Secretary to the Senate.

New College, Edinburgh,
September 1, 1858.

CONSUMPTION HOSPITAL, BROMPTON.

—Relying on INCREASED AID from the Public, the Committee have determined to RE-OPEN all the WARDS on the 1st NOVEMBER, for the Winter Months.

A large number of Out-Patients are daily seen by the Physicians.
PHILIP ROSE, Hon. Sec.
HENRY DOBBIN, Sec.

CRYSTAL PALACE.—PICTURE GALLERY.

THE GREAT PICTURE by JAMES WARD, R.A., considered by the most eminent connoisseurs as the rival of the celebrated Paul Potter Bull, and which excited great interest at the Art-Treasures Exhibition, Manchester, is NOW ON VIEW in the New Gallery. Above 100 important Ancient and Modern Pictures have lately been added to the Collection now formed in the New Gallery within the Building.

THE PHOTOGRAPHIC EXHIBITION, adjoining the Picture Gallery, is NOW OPEN, and contains several hundred first-class specimens.

Applications for space for the Exhibition of sterling Works to be addressed to the Secretary.

THE GOVERNESSES' INSTITUTION, 34, SOHO-SQUARE.

—MRS. W. VAGHORN, who has resided many years abroad, respectfully invites the attention of the Nobility, Gentry, and Principals of Schools, to her REGISTER of English and Foreign GOVERNESSES, TEACHERS, COMPTONERS, TUTORs, and PROFESSORS, School Property transferred, and Pupils introduced in England, France, and Germany. No charge to Principals.

13, CLIFTON-GARDENS, MALDA-HILL,
(Removed from St. Mary's-terrace.)

LADIES' SELECT CLASSES—not more than Twelve in each Class.

Professors.
SIGNOR and SIGNORA G. CAMPANELLA (née Lindley).
Vocal Music and Italian—Signor G. Campanella.
Piano—Stenradia Bennett and Miss Van der Perrin.
Landscape Painting—David Cox.
Drawing—Signora Campanella.
French—Mons. Bourgeois.
German—Herr Koenigsmüller.
English Language and Literature—Signora Campanella.
History—Signor M. Minola.

The Classes RE-COMMENCE, after the Holidays, the FIRST WEEK in OCTOBER.—Communications respecting Lessons in the Classes, or in Schools or Families, may be addressed to Signor G. CAMPANELLA, at his residence, 13, Clifton-gardens.

QUEEN'S UNIVERSITY IN IRELAND.

QUEEN'S COLLEGE, GALWAY.
SESSION 1858-R.

FACULTY OF MEDICINE.

Dean of the Faculty.
CHARLES CROKER KING, M.D. F.R.C.S.I. M.R.L.A.

PROFESSORS.
Anatomy and Physiology—Charles Croker King, M.D. F.R.C.S.I. M.R.L.A.

Practice of Medicine—Nicholas Colahan, M.D.
Practice of Surgery—James V. Browne, M.D. L.R.C.S.I.

Material Medica—Simon M'Coy, F.R.C.S.I.
Midwifery, Diseases of Women and Children—Richard Do-herly, M.D., V.P. Dublin Obstetrical Society.

Medical Jurisprudence—Simon M'Coy, F.R.C.S.I.
Modern Languages—Augustus Bensch, M.D.
Natural Philosophy—Arthur H. Curtis, A.M.

Chemistry—Thomas H. Rowney, Ph.D.
Natural History—Alexander G. Melville, M.D. Edinburgh, M.R.C.S. England, M.R.L.A.

Logic and Metaphysics—Thomas W. Moffett, A.M. LL.D.

The Matriculation Examinations, in the Faculty of Medicine, will commence on Tuesday, the 14th of October.

Additional Matriculation Examinations will be held on the 24th of November.

Matriculation is necessary for those Students only who intend to proceed for the Degree of M.D. in Queen's University, or to become candidates for Scholarships, Exhibitions or Prizes in the College.

SCHOLARSHIPS AND EXHIBITIONS.
In the Faculty of Medicine Six Junior Scholarships of the value of 50s. each, and Six Exhibitions of the value of 15s. each, are appropriated as follows:—Two Scholarships and Two Exhibitions to Students of the first, second, and third years, respectively.

Also, Two Senior Scholarships of the value of 50s. each, and Two Exhibitions of the value of 25s. each are appropriated to Students of the fourth year.

The Examinations for Scholarships and Exhibitions will commence on Friday, the 23rd of October, and be proceeded with as laid down in the Prospectus.

In addition to the Scholarships and Exhibitions above mentioned, Prizes will be awarded by each Professor at the close of the Session.

Scholars of the first, second, and third years are exempted from a moiety of the Class Fees.

The Medical School of Queen's College, Galway, affords every means for the acquisition of Medical and Surgical knowledge.

MUSEUMS.—An extensive Museum, illustrative of Anatomy and General Pathology, Materia Medica and Toxicology, has been provided; and to facilitate the study of the Obstetrical branch of Medical Science, the College has purchased the Montgomery Museum.

HOSPITALS.—The Hospitals, to which Students are by a recent arrangement admitted, contain Two Hundred Beds, and are visited every morning by the Medical Professors, who deliver Clinical Lectures.

In order to induce Medical Students to attend the practice of the Hospitals during the entire course of their education, the fee for Hospital Attendance and Clinical Lectures equitably, has been reduced to 2s. for each Session.

CULTURAL SCIENCES.—Laboratories and apparatus exist for the cultivation of Chemistry and Zoology. The College is furnished with a Library, and a Botanical Garden, both under the control of the Professor in the proper season.

Further information may be had on application to the Registrar, from whom copies of the Prospectus may be obtained.

By order of the President,
WILLIAM LUTHER.

26th August, 1858.



NEWSPAPER

NOW IN COURSE OF ORAL DELIVERY.

MR. WILLIAM KIDD'S NEW LECTURES.

—Two lectures, of more than common interest, have just been delivered in this town (Guildford) by Mr. William Kidd, of Hammersmith. We have heard, say, that large audiences assembled to do him homage; and that the Hall was closely crowded on both evenings. . . . Mr. Kidd's reception was of such a nature that he will not soon forget it. He has left behind him a character, too, of which he may well be proud. —*Surrey Standard*, Sept. 22.

NOTICE. MR. KIDD will LECTURE at EXETER on WEDNESDAY, Oct. 7, at SIDMOUTH, Oct. 7, and at EXMOUTH, Oct. 8. He will then proceed, through Devon, into Cornwall; returning home the second week in November, in time to fulfil his WINTER ENGAGEMENTS.

Hammersmith, Oct. 2.

THE ABORIGINES OF LITERATURE.

HEROES AND VILLAINS—from the Novelists.
HEROINES—from the Novelists and Poets.
DISAGREEABLE PEOPLE—Pictures from Books of.
Mr. HENRY FORSTER reads Papers on the above attractive Subjects.—Application, by letter, to 19, Catherine-street, Strand.

SUPERIOR EDUCATION.—In a first-class

Establishment for YOUNG LADIES, situated within five miles south of London, there are a FEW VACANCIES. The education of a private family are offered combined with a sound English Education which is carried on under the immediate superintendence of the Principals. Every attention is paid to the religious and moral training of the Pupils, and habits of usefulness are inculcated. Professors of English, Latin, French, and German, and Accomplishments in German and French taught by resident Governesses. The house is large, standing in its own grounds, and the domestic arrangements are conducted with the greatest liberality. References given to the parents of pupils.—For Prospectuses, or further particulars, address L. M. N., care of Messrs. Waterson & Brodwin, 16, Henrietta-street, Covent-garden.

EDUCATION.—Two Ladies, Sisters, highly

educated and experienced in tuition, who receive a LIMITED NUMBER of PUPILS at their establishment, situated in a remarkably healthy and beautiful locality, five miles from the Regents Park, surrounded by large Garden and Grounds, have VACANCIES. The Pupils are under the immediate personal superintendence of the Principals, from whom they receive the utmost care and attention, and who are prepared to refer to eminent Professional gentlemen, whose daughters they have educated.—For terms, &c. apply to Mr. Wilson, 31, Great Russell-street, Bloomsbury.

FRENCH, Italian, German.—Dr. ALTSCHUL,

Author of "First German Reading Book," (dedicated, by special permission, to Her Grace the Duchess of Sutherland), &c. M. Philolog. Soc., Prof. Education.—TWO LANGUAGES TAUGHT in the same lesson, or alternately, on the same terms as one, at the pupils or at his house. Each language spoken in his PRIVATE LESSONS, and select, separate CLASSES for Ladies and Gentlemen. Preparation in languages for mercantile and ordinary pursuits of life, the Universities, Army, and Civil Service Examinations.—9, OLD BOND-STREET, PICCADILLY.

TO THE HEADS OF SCHOOLS AND COL-

LEGES.—Mr. FAHEY, whose Pupils have taken the highest honours in the Military Colleges of Woolwich, Addiscombe, &c., having arranged a Course of Lectures upon Fortification, and other subjects required in the Military Colleges and Public Competitions, is OPEN TO ENGAGEMENTS, commencing in September next.—Address, 28, Drayton-grove, Old Brompton, S.W.

Private Lessons as before can be taken separately.

MILITARY EDUCATION.—Preparation for

every branch of the Service (Line, Engineers, Staff), at the PRACTICAL MILITARY SCHOOL, ST. JOHN'S, LONDON. February last this establishment has sent 22 Candidates for Examination, all of whom passed creditably; among them the First on the list in February, the First in April, the Fourth in June, the Fifth in July. A large number of candidates 15th.—Apply to Captain LEIDY, Sunbury, S.W.

TO INSTITUTIONS AND SCHOOLS in the

Neighbourhood of LONDON.—LECTURES delivered on GEOLOGY, ASTRONOMY, the HOLY LAND, PHYSIOLOGY, and GENERAL HISTORY.—Address ALFRED, Street Brothers, 21, Serle-street, Lincoln's Inn, W.C.

UNIVERSITY COLLEGE, LONDON.—

MR. and MRS. R. H. CLARKE, 30, OAKLEY-SQUARE, N.W.—A few Gentlemen studying at the College ACCOMMODATED WITH RESIDENCE, &c.—Reference: The Rev. J. C. Harrison, Park Chapel, Camden-town; J. J. Garth Wilkinson, M.D., 4, St. John's Villas, Finchley-road; and James Walton, Esq., 25, Upper Gower-street, W.C.

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Deposits made by Special Agreement may be withdrawn without notice.

The Interest is payable in January and July.

PETER MORRISON, Managing Director.

Forms for opening Accounts sent free on application.

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OF CANADA.

FINAL CALLS ON SIX PER CENT. PREFERENCE CAPITAL.

NOTICE IS HEREBY GIVEN, that the remaining Instalments on the Preference Debenture Certificates have been called, and will be due and payable as follows:—

Ten per Cent. on Wednesday, the 29th October, 1858.

Ten per Cent. on Monday, the 21st February, 1859.

The Debenture Certificates must be presented at Messrs. Glyn, Mills & Co., 27, Abchurch-lane, London, E.C., when the payment of each instalment is made.

Six per Cent. interest will be charged on all Instalments not paid at the above dates, and so long as they remain in arrear, no interest will be payable on the instalments already paid.

Interest at the rate of 6 per Cent. per annum will be paid on all sums received in advance of calls.

Holders have the option of receiving any amount in advance, and if they pay up in full, at once receiving Debenture Bonds with Coupons attached.

In order of the Board of Directors, C. P. RONEY, Secretary.

21, Old Broad-street, London, E.C.

September 27th, 1858.

WANTED, by a SCIENTIFIC CHEMIST, who has a Diploma, a LECTURE and TEACHERSHIP of CHEMISTRY and ALLIED SCIENCES.—A. B., Royal College of Chemistry, London.

LONDON INSTITUTION.—SHARE WANTED.

—Price and particulars to be sent to Mr. HATHAWAY, No. 1, Great St. Helen's, London, E.C.

SCHOLASTIC.—CLAPHAM PARK.—Mr.

LONG PREPARES PUPILS for the Oxford and Cambridge Middle-Class Examinations, for Matriculation, for the Civil Service Examinations, and generally for Professional and Mercantile Purposes. Terms inclusive. Mr. Long's Candidate at the late Oxford Examination stood in the First and Second Senior Divisions. Mr. Long has experienced Masters, and a Training Department under a Lady.

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NEW OXFORD-STREET, October, 1858.

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Pub. at Offered at

QUARTERLY REVIEW, No. 200 to No. 206, a. d. a. d.

(March, 1858) 6 0 2 0

EDINBURGH REVIEW, No. 212 to No. 218, a. d. a. d.

(April, 1858) 6 0 2 0

BRITISH QUARTERLY REVIEW, No. 43 to 54, (April, 1858) 6 0 2 0

Previous Numbers of each of the above, from Jan. 1853 6 0 1 0

BLACKWOOD'S and FRASER'S MAGAZINES, 1856 and 1857 2 0 2 0

BLACKWOOD'S and FRASER'S MAGAZINES, 1856 and 1857 2 6 0 3

Previous Numbers, from March, 1854, each 2 6 0 6

Previous Numbers, from January to June, 1855 2 6 1 0

WESTMINSTER REVIEW, Nos. 16 to 26, (April, 1858) 6 0 2 0

NATIONAL REVIEW, 1856 and 1857, per set 20 0 7 0

BENTLEY'S MISCELLANY, 1856 and 1857, per set 20 0 0 0

January to June, 1858, .. per number 2 6 1 0

NEW MONTHLY MAGAZINE, 1856 and 1857, 42 0 6 0

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the following CATALOGUES of their Stock:—

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MUDIE'S SELECT LIBRARY.

NOTICE.

Subscribers are recommended to make EARLY APPLICATION for the following Works, as the Surplus Copies will be withdrawn for sale as soon as the present demand has subsided:—

Buckle's History of Civilization in England.—Livingstone's Travels in Africa.—A Woman's Thoughts about Women.—Wiemann's Recollections of the Last Four Popes.—Anderson's Visit to Lake Nyman.—Atkinson's Explorations in Siberia.—The Ladies of Bever Hollow.—Two Years Ago, by Charles Kingsley.—Napier's Life of Sir C. Napier.—A Lady's Journal of the Siege of Lucknow.

Northey's—Memoirs of the Duke of St. Simon.—Barth's Travels in Africa.—In and Around Stambul.—Combe's St. Paul.—Ree's Siege of Lucknow.—Sleeman's Journey through Oude.—Mackenzie's Life of Buxtehude.—Scenes of Clerical Life.—Year after Year.—The Year Nine.—Life of George Stephenson.—Guizot's Memoirs of His Own Time.

October, 1858.

CHARLES EDWARD MUDIE, New Oxford-street, London.

OWENS COLLEGE, MANCHESTER, (in

connexion with the UNIVERSITY OF LONDON).

SESSION 1858-9.

The College will OPEN for the Session on MONDAY, the 4th of October next. The Session will terminate in July, 1859.

Principal.—J. G. GREENWOOD, B.A.

Courses of Instruction will be given in the following departments, viz.:—Languages and Literature of Greece and Rome.—Comparative Grammar, English Language and Literature.—Logic, Aesthetics, Moral Philosophy.—Jurisprudence and Natural Philosophy.—History.—Jurisprudence.—Political Economy.—Scholarship, Elementary, Analytical, and Practical.—Natural History (for this Session, Anatomy and Physiology of Man and of the Animal Kingdom).—French and German Language and Literature.—and Drawing, including Mechanical and Anatomical Drawing with Painting.

EVENING CLASSES FOR PERSONS NOT ATTENDING THE COLLEGE AS STUDENTS.—The Evening Classes have been extended, so as to include the following subjects of instruction, viz., English Language, Logic, Classics, Mathematics, History, Jurisprudence, Political Economy, Chemistry, Natural Philosophy, French and German.

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SCHOLARSHIPS AND PRIZES.

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LONDON, SATURDAY, OCTOBER 2, 1858.

LITERATURE

Fasciculi Zizaniorum Magistri Johannis Wyclif, cum Tritico. Ascribed to Thomas Netter, of Walden. Edited by the Rev. W. W. Shirley, M.A. (Longman & Co.)

WE have more than once had occasion to speak in the highest terms of the service rendered to history by the publication of these State Papers. We have noted the judgment displayed in the selection of material, and the skill and care with which their part of the work has been discharged by the different editors. The plan advisedly laid down by the Master of the Rolls has been kept:—consistently with brevity, the soul of the undertaking, the biographies have been written; the editors have not thought fit to superadd to the titles of the MSS., nor to impart to the public controversial notions of their own; they have contented themselves with being useful rather than original, and have done their best not for the strictly ancient so much as the intelligent modern reader.

Mr. Shirley, however, to whom the present book has been committed, appears to have proceeded upon a different plan. "Those to whom," he tells us, "he was especially bound to defer, having expressed their judgment," he took upon himself the "responsibility of not following their advice"; but subsequently he "so far modified" his principles as to be in a condition to follow it. This modification of principle, however, he implies, has led him into an odd practice. He has retained in one case a reading which he feels sure is wrong, and has edited the work in two ways. The first part is given in Mr. Shirley's own way, which we are edited to understand is the right way; the other part in the modified, which, of course, is the wrong way.

We note another instance of responsibility which Mr. Shirley appears to have taken upon himself. He has altered the title of the MS. '*Fasciculi Zizaniorum*'—'*Bundles of Tares*'—is the title to the collection of writings ascribed to Netter of Walden. This description Mr. Shirley does not consider strictly correct. Apparently without modifying his principle, and simply on his own authority, the editor prints in the title-page, '*Fasciculi Zizaniorum, cum Tritico*'—'*Bundles of Tares, with Wheat*.' For the sake of philology, Mr. Shirley has, we are informed, preserved a number of archaisms. He has had the privilege seldom, if ever, enjoyed by an editor, of conducting controversy at the public expense, and of bringing into print a MS. upon which he has not chosen to shed any clear editorial light. Mr. Shirley knows, he informs us, that the volume he sends out is "imperfectly edited," but he has been a good deal engaged,—has not been allowed sufficient time,—and "it is a consolation to reflect" that it may fall into the hands of those who have more knowledge of the subject, who will supply what the editor has omitted, take the trouble of analyzing the original text, and generally speaking will appreciate what the editor has failed to do for the volume!

Wycliffe was the foremost man of a stirring and eventful time. The half-century which closed his life is a brilliant epoch in the history of discovery, science, constitutional law, and government. It is an epoch of war, of tumult, of physical and political disturbance. It is full of the flash and splendour of battle—it is disastrous with results of earthquake and pestilence. The fountains of the great social and ecclesiastical deeps are beginning to be broken up, and the windows of Heaven, so long dark,

seem at length likely to be opened. In Europe there are sights of contending kings, and the spectacle of two Popes destroys traditional belief, and disturbs the balance of infallibility. Frenzied bands of flagellants—shrieking out psalms, and scourging their flesh till the blood spurts out—sweep on in a wild chase through the cities and villages. The fields are waste and the flocks deserted. Insurgent troops of Pastoreux enter the churches, occupy the pulpits, and taunt monks and friars, canons and bishops. The voice of a hungry, uneducated, sorely-burdened people is beginning to be loudly heard everywhere crying for deliverance. The Church is a house divided against itself, and its separate parts only care for aggrandizement and dominion. The parochial clergy object to the preaching friars, and the preaching friars object to each other. For the acquisition of local wealth, and the security of general ignorance, it might appear that ecclesiastical bodies had been chiefly ordained. In England, a spirit of sturdy resistance is growing up, which exhibits itself in harangues in the open air, in discussion in university halls, and in parliamentary councils. For an English Parliament has now a distinct voice,—English law is grown up to a stately height,—the shadow of Magna Charta is over every lowly and lofty house, over every abbey and country church. England's king can be no longer a vassal; and, out of the ruins of a foreign speech and philosophy, and simultaneous with independent life and thought, rises up the shapely fabric of a new language, a literature, and a religion. The tendency of the day is towards Realism. Norman and Saxon, knight and franklin, learned and lewed man, are fast blending together, and will soon find their greatest common measure in a practical Englishman. Chivalry, with all its good and ill, has passed its meridian, and the shadows of history, less bland and more true than those of afternoon, scatter little bloom on the images of the Templars. In the University of Oxford there is already a stir of scientific life. Roger Bacon, the Franciscan—assisted, as is thought, by an afflatus of evil—has invented a strange explosive powder, which will be found valuable to Englishmen at Poitiers; and he is, moreover, believed to hold heretical theories respecting the powers of compressed vapour, and the waves and repercussions of light. Navigation, too, is growing bolder, a fashion having been introduced of steering ships by observation of a needle poised upon a card,—a device of some follower of the false prophet, tending to weaken, if not destroy, all religious dependence upon the stars, and to make sailing a mere matter of course, with little or no reference to saints and angels. In England, the Church, indeed, reigns, but no longer governs. Nominalist and Realist have tilted long enough; the work-day world chooses to be realistic, sweeping away the shreds of scholastic dispute into the philosopher's paradise, as the storm of actual battle or the terror of pestilence draws near. These are days which give no pleasure to a gloomy chronicler. It is the Last Age of the Church, for—1. The land is sitting in darkness and in the shadow of death; 2. There is the midday's devyline,—that is to say, Antichrist; 3. Chaffare walking in darkenessis,—that is to say, simony." The land, Wycliffe tells us, is full of Kaimes Castles,—that is, castles of Cain, or colonies of Carmelite, Augustine, Jacobite, and Minorite Friars:—

"Frere's don many harmes in y^e chirche—they spylen the puple many wayes, by hypocrysy and other lesynge; and by this spyling they bidden Kaimes Castles to harm of countries. They stelen poore mennis children, and they stelen gladly lives.

They leave to speak of steling of women. And thus they make landis barren, for withdrawing of workmen,—not only in default of cornis, but in bestis; and letten [hinder] alms to be given by Goddis law. They letten true prestis for to preache, and specially Christis Gospel; they moven landis to battle, and pesible persons to plead; they maken many divorcis, and many matremonees unlawful; they leave to speak of fighting. In the last journey that Englishmen made to Flanders they spyled our realm of men and money."

The authority of the Church was derived from possession rather than from knowledge or truth. The clergy no longer led the intellect and interpreted the wants of their age. They were not by any means among the best or the holiest, as a hierarchy among the proudest and most covetous of men. If they sought the poor man it was not to educate, but rather to move him to greater regularity in paying tithe and toll. The picture, which the ballads of the time, and Chaucer, Langland, and Gower give, even admitting for exaggeration, leaves a sad residue to the discredit of the clergy. In one of the political ballads of the time the question is asked, "What was the reason, when God wandered on the earth, that he could not ride?" The answer represents the popular opinion: "Because he could not bear a retinue of greedy attendants by his side, in the shape of grooms and servants to insult and oppress the peasantry." The contrasts were marked and glaring. Cloth of gold was often opposed to home-spun russet and cloth of frieze. The abbot's park, and his warren, and his fishponds, the Bishop's castle, upon the beautifying of which so much money was spent, came into too lordly contrast to the reeve's grange or the hut of the villein. Good men and kind there were among the prelates, and it would be wrong to be silent in our obligations to them on the score of painting and architecture. They dug, they planted, they builded, they raised soldiers, advocated crusades, and served their generation a good deal in the military way. The Pope drew out of the realm an annual revenue almost equal to that of the sovereign; he claimed the first-fruits of all benefices—the patronage of all vacant livings—the appointment of bishops and archbishops—the power of making reversionary grants during the lifetime of the incumbents—and the right of conferring sixty or seventy benefices at will upon Italians who might, or might not, reside within the realm. The traffic in these livings, appeals, and counter-appeals furnished employment and subsistence to a large and non-productive class. Then followed the ecclesiastical irregulars, or Free Companions. 'The Vision of Piers Ploughman' describes them: the Preaching Friars who "came in the curates to helpen," but who only "harried em harde and helped em full little." Then there were "japers and janglers—Judas' children. Bidders and beggars with hive bellies and hive bagges of breed full y-crammed, pilgrims and palmers who had plighthen em to seek St. James and saints—and had leve to lyen (lie) all hire life after—hermits on a heep with poked staves going to Walsingham and their wenches after—grete lobies and long—loth to swynke." Such, in brief, was the church question when Wycliffe came into the world.

The date of Wycliffe's birth is conjectural. Mr. Shirley gives, as Lewis's opinion, "that he was born, very probably, about the year 1324." The date of his death is, according to Mr. Shirley, equally conjectural too. We are glad to find, however, that, respecting this, there is "a tolerable presumption." The editor tells us, "in the Preface to his Sermons, written in the year 1382, and therefore when, according to Lewis, he was

fifty-eight years old, he speaks of himself as collecting them, 'in fine vite'; and the extraordinary literary activity which he displayed in the months immediately succeeding this publication affords a tolerable presumption that his health was not yet seriously impaired." A foot-note, however, contradicts this "tolerable presumption." There we are told, "Dr. Gascoign informs us that Wyclif suffered from paralysis during the last two years of his life." 'The English Chronicle' of the reigns of Edward the Second, Edward the Third, and Richard the Second, distinctly gives the date of Wycliffe's death as 1387:—" (1387). This year deide Master Jon Wyclif, and was buried at Lutterworth, where he was parson—but afterward, by sentence of the churche, his bones were taken yp and brent." The chief known facts in Wycliffe's biography were that he was born at a village one mile from Richmond in Yorkshire (which Leland terms Sperswell and Mr. Whitaker conjectures to be Hisswell),—that in 1361 he was Master or Warden of Balliol,—that for the fifteen following years he was the chief leader against Papal aggression,—and that, after successively holding the rectories of Fylingham and Ludgershall, he died rector of Lutterworth, in Leicestershire. "His literary life," says Mr. Shirley, "may be divided into three great periods, the first extending to the year 1366 or 1367, or three or four years later than his Doctor's degree,—the second to the great schism of the West,—and the third to the close of his life." Of the events of the first period very little is known, though much has been surmised, and more disputed. To Dr. Vaughan we are indebted for the first attempt to set Wycliffe historically before the public. Mr. Shirley impugns a few of his facts, and questions some of his topographical statements, but he gives us in their place nothing but the benefit of a variety of his own unsustained and unsustainable opinions. It is his endeavour to exhibit Wycliffe as little of a Reformer as possible.

"It is idle," says Mr. Shirley, "perhaps to conjecture what might have been; but if Wyclif had died before his denial of transubstantiation, strange dream as it seems, it is less strange than the real life of Francis of Assisi, his name might have come down to us in another form, and miracles have been wrought at the tomb of their founder by the brothers preachers of St. John Wyclif." No "less idle, perhaps," and scarcely less strange a dream is Mr. Shirley's general notion respecting Wycliffe and his followers:—

"For the more general study of the Bible, Wyclif did more, perhaps, than any one; but the education of the individual conscience to independence could not be effected in a day. Upon the generality of thoughtful men in his day, the external authority of the Church of Rome had a hold which they could not shake off; again and again the most devoted of Wyclif's disciples are found returning with recantation to the bosom of the Church, unable to support their terrible isolation. In this, therefore, the most essential point of his whole system, he was unable to count on retaining the support of any but a few presumptuous fanatics, the fools who rushed in 'where angels feared to tread.'"

After the peculiar theological leaning which these passages indicate, it appears strange that Mr. Shirley should disapprove of making Wycliffe "the watchword of a theological controversy, invoked most loudly by those whom he would most have condemned." The editor's historical accuracy appears in the following passage:—

"In May, 1366, the Parliament met to consider Urban's application for twenty-three years of arrears of the tribute. The demand was ill-timed. If the Pope could otherwise have supposed that no part of the popular excitement against France should be extended to the court of Avignon, the

passing of the celebrated statute of Præmunire, only two years before, ought to have placed him on his guard."

A writer who thus antedates history cannot be implicitly depended upon when controverting the statements of preceding biographers. He postdates history also. The statute of provisions we were in the habit of connecting with the year 1350; Mr. Shirley misplaces it thirteen years later, in 1363. Mr. Shirley's propositions in favour of a second John Wycliffe, Fellow of Merton, who, and not the Reformer, was Warden of Canterbury Hall, we are "compelled to surrender." The arguments *pro* and *con* are as follows. In 1365 a John Wycliffe was found Warden of Canterbury Hall, a foundation exclusively appropriated (by the Archbishop who appointed the Warden) for secular priests. In 1367 an appeal is made against Wycliffe, and a new warden appointed. The bursar's rolls of Queen's College, a foundation peculiarly favourable to secular priests, prove the residence of John Wycliffe between 1363 and 1380. Middleworth and Selby, two of the Fellows of Canterbury Hall, are found in company with this Wycliffe. There is an express testimony of Wodeford, a monk of the Grey Friars, that the Wycliffe expelled from Canterbury Hall was the Reformer. An anonymous chronicle quoted by Leland says, "Wycliffe studied at Canterbury Hall, and walked about in a gown of russet, and barefooted." To this evidence Mr. Shirley replies thus:—"The modern arguments are of very little importance. Leland's chronicler only proves what is admitted on all hands, that about a century after the Reformer's death the story was in general circulation." "The argument [as to Middleworth and Selby being found at Queen's in company with Wycliffe] assumes, what is far from certain, that the Middleworth and Selby of Queen's are the same with the Fellows of Canterbury Hall," the presumption being apparently strong that the Canterbury Hall was Queen's in a previous state of existence, and that the names coupled with one would, as a matter of course, be coupled with the other.

To "Wodeford's statement," Mr. Shirley is of opinion, "great weight must undoubtedly be attached. On the other hand, it must not be left out of view that Wodeford can scarcely have spoken from his own recollection. His lectures must have been written in extreme haste; and his statement, which he never afterwards repeats, was made at a moment of great controversial excitement, when any story to Wyclif's discredit would have been told and listened to without examination." Presumptions of this kind determine Mr. Shirley in favour of himself. "Evidence," he says, "gains materially in value by the consideration of a principle which is very generally applicable to the comparison of earlier and later testimony. Facts (or presumptions, or ideas) which are not of general interest, if preserved at all, will have passed, perhaps, but through one or two hands, while the public history of the day will have passed through eight or ten." In other words, Mr. Shirley's facts, though not of general interest, are of great value; while previous lives of Wycliffe, though apparently interesting, are worthless. Vaughan, Le Bas, Baber, Todd, and all Wycliffe's biographers and historians, make mistakes about dates; and Mr. Shirley, from his superior information, is enabled confidently, if not always satisfactorily, to correct them.

It appears strange that a writer possessed of such complete historic information should entirely omit reference to the excesses of the mendicant orders which first called forth Wycliffe. Mr. Shirley aims to represent the Reformer as a political rather than a great religious leader

—a schoolman, a philosopher, a master of language,—anything, in fact, but what he was—in administrative ability and fearlessness the combination of Wesley and Luther. Master John Wycliffe, with his spare frame, saintly look, and eye full of English purpose, able to stand up in his russet gown before Chancellors and Kings, inveighing against some white-bearded Franciscan at Oxford, studying that "crabbed divinity, all whose fruit is thorns," or poring over a Latin Gospel in his thatched little chamber at Queen's, or sending forth "his simple priests" with bare feet and russet gowns to carry a living Bible over the land, or again cited to St. Paul's, and making his way through a great press of people, while the Bishops shake like reeds, and last of all, worn and old, dying of paralysis through two slow years at Lutterworth,—we cannot collect from Mr. Shirley's sketch, for he is evidently not in Mr. Shirley's mind.

The collection of tracts and documents, partly controversial, partly narrative, of which the manuscript of the Fasciculi consists, has been hitherto ascribed to Thomas Netter, of Walden, provincial of the Carmelite order. He was born about the year 1380, was confessor to Henry the Fifth, tutor to his son, and from his vigour in prosecuting the Lollards has been thought to have been Inquisitor-General in England. The narrative refers to such events as happened subsequent to 1372 (or as Mr. Shirley places it, 1363), when Wycliffe took his Doctor's degree,—and the year 1428, the date of the examination of William Whyte, charged with heresy and brought up in chains before the Bishop of Norwich. The growth of Lollism or Lollardism from the blade to the full ear, and the difficulty which the orthodox reapers had in separating it from the true seed and eradicating it, are traced in professional theses, mandates, acts, university letters.

To enter more fully into detail would be to do what Mr. Shirley has failed to do, that is, to edit the book.

Hardy's Tourist Guide through Ireland: in Four Tours. By Philip Dixon Hardy. (Dublin, Hardy & Sons.)

A Trip to Killarney and the South of Ireland. By J. W. Aspler, M.A. (Bennett.)

FROM the Golden vale near Mallow, where "if you stick a shillelagh in the ground at night, you won't see it when you get up in the morning," to the barest summit of the Paps, where that keen anatomist, the carrion crow, sits speculating upon the internal structure of a lamb's eye, Ireland delights us. Every one writes against the absentee landlords, why does no one rail at the travellers who avoid the Causeway, and go delighted to see a less curious thing further off at Staffa,—who are ignorant of the terrific wildness of the Grey Man's path, where the Devil sits clapping his black hands (black ever since he dirtied them at Liverpool in the slave trade), and fuss off to the *Mauvais Pas* at Chamouni, which, compared to our Antrim lion, is but a flea-bite? We suppose the near will always be snubbed for the distant,—Julia, the wife, for some disreputable Cleopatra of the imagination,—the near Downs for the far-off mountains. It will take 300 years before we Englishmen discover that Ireland is not all bog and barrenness,—that strangers are not always shot from behind hedges,—that Connemara is Fairyland, and Killarney Heaven. Till then, we can but utter our protest, and entreat tourists to become General Wades, and cut out roads of their own. Ireland is cheap and accessible; the people generally speak English, and are the drollest in the world. They are grateful, witty, generous, polite, obliging,—and, as to their

women, beautiful. Those who like can talk English, those who like can grapple with a new and poetical language that has its own epics, romances, and fairy stories. It is our own land, too, and bought with our blood and money. There is Antrim for coast, for cliff, and caves,—Donegal for savagery,—Mayo for wild beauty,—Killarney for enchantment,—Kerry generally for mountains,—and Connemara for everything, wild as Tartary, beautiful as the unoccupied world ere the gate of Paradise was barred and Death placed to ward it. Go by Wales, and dream in the railway-carriage that you are sitting opposite two Welsh kings, who have taken "first-class returns" to Dublin. In a sleep you are borne across. The bell at the South Wall awakes you, a fierce jaunting-car skims you to Dawson's or the Hibernian. You awake, and Nelson from his Pillar greets you. A new sun shines on you, you are in the shamrock land, and over the city-houses are blue mountains, just as when the Normans began their agitation here ages ago. Thanks to the rule of the Saxon, the people are barefooted still! Their brain runs over with wit, their eyes with laughter, but their purses, alack! are gone to feed absentee English landlords.

Port-na-Spania, grown so familiar to us by Stanfield's generalized but grand picture, furnishes Mr. Hardy with several affecting stories,—the enthusiasm, superstition, and strong passions of the frieze-wearing Celt heightening their simplest stories to almost the dignity of legends:—

"The guides relate several interesting stories of individuals, who fell from the heights in this neighbourhood. From the Aird Snout, a man named J. Kane tumbled down while engaged in searching for fossil-coal during a severe winter—and, strange to say, was taken up alive, though seriously injured by the fall. Another man, named Adam Morning, when descending a giddy path that leads to the foot of Port-na-Spania, with his wife's breakfast, who was at that time employed in making kelp, missed his footing, and tumbling headlong, was dashed to atoms ere he reached the bottom. The poor woman witnessed the misfortune from a distance; but supposing, from the kind of coat he wore, that it was one of the sheep that had been grazing on the headland, she went to examine it, and found instead, the mangled corpse of her husband. Another story is told of a poor girl, who, being betrothed to one she loved, in order to furnish herself and her intended husband with some of the little comforts of life, procured employment on the shore, in the manufacture alluded to, with some other persons in the neighbourhood. Port-na-Spania, as will be observed, is completely surrounded by a tremendous precipice from three to four hundred feet high, and is only accessible by a narrow pathway, by far the most difficult and dangerous of any of those nearly perpendicular ascents to be met with along the entire coast. Up this frightful footway was this poor girl, in common with all who were engaged in the same manufacture, obliged to climb, heavily laden with a burden of the kelp; and having gained the steepest point of the peak, was about to place her foot on the summit, when, in consequence of the load on her shoulders shifting a little to one side, she lost her balance, fell backwards, and ere she reached the bottom, was a lifeless and a mangled corpse. To behold women and children toiling up this dreadful ascent, bearing heavy loads, either on their heads, or fastened from their necks and shoulders, is really painful even to the least sensitive, unaccustomed to the sight—and yet the natives themselves appear to think nothing whatever of it. An anecdote is also related of a man who was in the habit of seating himself on the edge of a cliff which overhung its base, at Portmoor, to enjoy the beauty of the widely extended scene. One fine summer morning, however, having gained the height, and taken his accustomed seat, while indulging in the thoughts and feelings which we may suppose the

scene and situation likely to inspire, 'a change came o'er the spirit of his dream,'—the rock on which he was perched gave way, and in the twinkling of an eye, bore him on 'its rapid wings' to the foot of the precipice, where it sunk several feet into the earth—safely depositing its ambitious brestler on the shore, at a distance of fully four hundred feet from the towering eminence whence he made his involuntary aerial descent. Some viewless sprite or guardian angel, as the neighbouring peasants affirm, having safely conveyed him down—as he had neither bone broken, nor joint dislocated."

The traditions of Raleigh's gable-ended house at Youghal are interesting:—

"The house and garden of the latter celebrated individual will especially interest the stranger. The house has not undergone much alteration—the interior is in its original state; wainscotted throughout with fine old Irish oak, in excellent preservation. The panels in some of the rooms are richly carved, especially in the drawing-room, the chimney-piece of which presents an exquisite specimen of the elaborate work of the day, being enriched with various grotesque figures and emblems. The roof being also of Irish oak has remained untouched, having apparently suffered nothing from the hand of time. This interesting place derives its present name, of Myrtle-grove, from the many beautiful myrtle-trees which still flourish luxuriantly here; some of them having attained a height of nearly twenty feet. The strawberry arbutus also, and many other delicate shrubs, afford abundant evidence of the extreme mildness of the climate. These remind one strongly of the refined taste and feeling exhibited by Raleigh, in the cultivation and adornment of this, for some time, his favourite retreat from the turmoil and storms of Court life. In these gardens we are told he first propagated the potato, which he brought from America. Tradition says, that the person to whom he entrusted the care of those first planted, 'imagining that the apple which grew on the stalk was the part to be used, galled it, but not liking the taste, neglected the roots, till the ground being dug afterwards to sow some other grain, the potatoes were discovered therein, and to the great surprise of the planter, vastly increased; and from those few this country was furnished with seed."

Again, in conclusion we say, let the traveller who has not seen Ireland go; stand not upon the order of his going, but go at once. Let him scare the eagle from Benabola and the Twelve Pins, and look down on Lough Corrib, Lough Mask, as he lies on heath and "silver leaf," eye-bright, gentian, bearberry, and maidenhair. Let him botanize, or legendize, shoot or make love, bring down grouse or statistics, chase wild ducks or stills, chum with revenue officers, feast at inns kept by friendly Vicars of Wakefield, and return with less desire to catch lobsters in the North Seas, when such an Arabian Nights' world is open to him in a few hours' steam. The Devil's Glen or the Phouca's Waterfall, Fin Mac Coul's Causeway, or the Grey Man's Path, O'Sullivan's Cave, or the O'Donoghue's Lake, each or all would fill his mind with visions of beauty for many a foggy London day.

French Society in the Seventeenth Century, after the Grand Cyrus of Mlle. de Scudéry —[La Société Française, &c.] By M. Victor Cousin. (Paris, Didier & Co.)

We have always, from our English distance, been accustomed to regard 'Le Grand Cyrus,' by Mlle. de Scudéry, as one of those pieces of elaborate affectation, the day for which has for ever gone by; and it may be questioned whether one in a thousand of the most tolerant or cosmopolitan of English romance-readers has ever turned a page of its ponderous volumes. M. Cousin tries to tempt the reader to re-consider and study anew the romance, the authoress, the mannered circle of

wits of whom she made one, and the times in which she lived; but we are not sure that, though he "charms wisely," he will succeed in enchanting the public to any general admiration of his new heroine. Curious his book is, no doubt, and instructive for every one who is not minutely read in French history and memoirs; but it reflects the nature of its subject, and, whether from design or inevitably, is faded and tedious: not altogether natural in the degree of admiration expressed, nor just in its estimate of men, manners, and opinions.

The very argument and purpose of the book establish a case of "hard reading" for most of us. Allegory is no doubt dainty and delectable, but it is rarely, if ever, without a certain deadness, which, if prolonged, is fatal to patience and interest. We owe to John Bunyan the exception which proves the rule, confessing, at the risk of being anathematized, that *Mirza's* bridge is about as long a pilgrimage as we can bear, and that even the sharp and pointed tales of Voltaire, in some sort allegorical, are endured because of their wit, not read by reason of their story. Now, neither M. Cousin, nor the dear, long-winded French lady whom he does his best to recommend, has a diamond spark of wit between them. All is solemn, Arcadian, genteel, and oppressive,—

Yawning content and melancholy peace.

The book, like its subject, is somewhat a dreary curiosity of literature.

The ten volumes of 'Le Grand Cyrus,' the publication of which romance was spread over four years, from 1649 to 1653 (a curious anticipation, by the way, of our Richardson's proceedings in regard to his 'Clarissa'), are dedicated, M. Cousin reminds us, to Madame de Longueville. Though they bear the name of a man, "M. de Scudéry, *Gouverneur* de Notre Dame de la Garde," they were, in reality, the work of his sister. The governor merely fitted out the tale with prefaces and dedications, as Mr. Edgeworth, the "claret, brisk, and endless" man commemorated by Byron, did his daughter Maria's novels; but the work was the lady's, done under circumstances of fantastic secrecy, which were no secret to the circle of elegant persons among whom the novelist figured, though they added to the piquancy of the transaction. The tale, after all, was not of classical times and historical personages, and heroic sentiments, so much as a gallery of complimentary portraits of a charming circle of ladies and gentlemen. Who can avoid being diverted at the idea of *Mandane* searching the pages to see what was to be found there in honour of *Cyrus*, of *Artamène*, and *Arasinte*, sitting as in a court of polite criticism on the nicety of the epithets which described their graces and accomplishments? Fancy, to illustrate the difference of times, humours, and manners, a 'Sir Charles Grandison' coming out in volumes, devoted to the wit and the Whiggery of the Holland House coterie. No wonder that even in France (where the sense of the ridiculous is so curiously restricted, and where things have always passed under the sanction of the genteel gravity, which would have waked

Laughter holding both his sides

in England) the romance and its realities were found matters for satire as much as for edification. This, however, M. Cousin, we apprehend, would hardly be disposed to admit. In his third chapter, after having told us what name Madame de Longueville bore, what name Condé in Mlle. de Scudéry's book, he goes on to panegyrize it "as a historical work of the highest value," tells the old stories of the Siege of Dunkirk, of the Battles of Lens, Rocroy, and Charenton, with a prolixity which is amusing, to say the least of it. In chapter the fifth we

get again among characters, and among the adventures of Christina, Queen of Sweden—signified as *Cleobuline*, Queen of Corinth—told, we are assured, with a nice regard to their complication and delicacy by the *Sapho* of the tale (for *Sapho* is Mdle. de Scudéry's self—by herself complimented to perfection). In the sixth chapter we come on ground where it may be as well to loiter for a paragraph or two—none other than the Hôtel de Rambouillet, its *coterie*, and its presiding spirits.

Of this we conceive a bright picture might have been given by any one who commanded, merely in a partial degree, the *Walpole* touch, which brings out anecdotes and groups traits so as to set before us the dead or the distinguished in the fullness of their lives and humours. M. Cousin shows no deficiency of knowledge, no want of industry; he is not afraid of citing as authorities certain wicked witnesses who, it might have been imagined, were somewhat beneath the dignity of his credence,—for example, he cites perpetually the spiteful and highly-spiced *ana* of Tallemant des Réaux; but there is no character in his elaborate interior of the palace of *Clémire* [*sic* in Mdle. de Scudéry's novel]. Its principal inmates and guests are but pale figures, such half-washed-out divinities as may be found on some ancient fan. Let us illustrate this by paraphrasing a few passages from the seventh chapter of our painstaking historian, which is devoted to the *Elise* of 'Le Grand Cyrus.' *Elise* was Mdle. Angélique Paulet, and she was the daughter of that Charles Paulet, one of the Secretaries of King Henry the Fourth, the inventor of that celebrated tax known under the name of *La Paulette*, which consisted in a certain sum that the Members of Parliament, and generally the officers of judicature and finance, paid annually to the State, in order that after their death their *charges* should be maintained in their families and pass down to their heirs. * * The inventor of this tax was the first farmer of it—made a fortune thereby,—and became a man of sufficient consequence. Angélique Paulet was born about 1591 or 1592. She was nearly of the same age as Madame de Rambouillet. Her beauty made her remarked at an early period; and while she was very young she had the greatest success at the gallant court of Henry the Fourth. Her father, who was ambitious, enhanced the attractions of his daughter, by giving her all manner of masters, in order to develop her powers of pleasing. She danced and sang in a ravishing manner. She touched the lute with rare talent. What was more, she had much intelligence, vivacity, and warmth in her eyes,—and an air of laughtiness, which with her fair hair, a little too golden, procured for her later the name of "*la belle lionne*."

Then M. Cousin proceeds to draw on Tallemant for an anecdote, reminding us of old Crashaw's tale of 'The Lutanist and the Nightingale.' A pair of nightingales were found dead (of hearts broken by envy) hard by a fountain, where this angelic Angelica had been singing all the day long. Then he brings in Mdle. de Scudéry's lumbering description of the kingdom of Phenicia, before he arrives at the little less heavy portrait of *Elise*. By degrees, those who will plough through all this heaviness will learn how Mdle. Paulet (skilled in music, thanks to the instructions of Guédon, the composer, the *Crysilé* of 'Le Grand Cyrus') created a sensation by singing as *Arion* seated on a dolphin's back, at a court festival given by Henry the Fourth. Tallemant adverts to the consequences of this success—in an epidemic court admiration for the young lady—with his usual causticity. M. Cousin is shocked, and believes there was nothing in all the scandals to which he adverts. But King Henry does seem to have been caught by the magic of *Arion's* voice; and when he died, Mdle.

Paulet put on court mourning for the monarch, with unusual emphasis, which, says our chronicler, "made her look lovelier than ever. Her beauty and her adventures" (he goes on to say, in a subsequent page) came to an end in good time. After a catalogue of lovers and rivals, of losses and crosses,—

the regular and retired life which she led [continues M. Cousin] after the death of her parents, when she enjoyed entire liberty, and had regained a part of her fortune, dispelled all clouds, and made her not merely received, but sought for, by people of the utmost worth, and by women of the highest consideration.

She was presented in due time at the Hôtel de Rambouillet, where she presently became one of the favourite members of the circle; did not quite (to quote Tallemant) therefore give up her lovers, but knew how to avoid the evil speaking of which M. Cousin is constrained to admit she had been the object in her young days. Indeed, says our historian, "Love was banished from the Hôtel de Rambouillet: all contemporary writers are unanimous on the point. There reigned merely that noble and gracious gallantry which, without costing anything of virtue, makes the sweetness and charm of human life. * * Many tender friendships, not one intrigue."

Without undue suspicion, or leaning towards the side of scandal, we fancy that others besides ourselves will wonder at rather than share M. Cousin's implicit faith in the chivalrous purity of the circle so highly lauded. This, however, leads us to his speculations on the tone and influence of such a society, which well merit respect and consideration. M. Cousin's social philosophies are, to our thinking, much more valuable than his draughtsmanship.

Granted that the taste and temper of the circle were euphuistic and coxcombical,—granted that the literary productions begotten and trained there have but a sickly value,—there is still a wholesome and true side of the subject, which should not escape those whose sense of humour is balanced by their love of truth. Something may be urged in favour of conceit, affectation, and double-refined courtesy. These may be needful as corrective and refining medicines in a society but one-half civilized. Even so, Brummel's "one pea" and essence-bottles, as illustrating Dandyism in all its quintessence, have been pleaded for as counter-blasts against the fashion of stable-oaths, of spitting through the void caused by the drawing of a front tooth, of box-coats and buckskins, which about Brummel's time was at its height among our nobility and gentry. The man-milliner was a protest against the amateur stage-coachman. There may be a scrap of reason in this notion,—it is ingenious, at all events; and, "with a difference," it is the argument adopted by M. Cousin. An academy of courtesy and genteel behaviour was wanted, he thinks, to keep "the balance true" betwixt frivolous profligacy and its sure concomitant, brutal coarseness. It does not follow, however, that the medicine, however sugared, shall be palatable,—that the institution, be it ever so serviceable, shall interest, the service once over. Euphuism is a study for the philologists,—but its elegancies, whether we encounter them in 'Love's Labour's Lost' or 'The Monastery,' are tedious, not diverting.

In the above paragraphs we have endeavoured to indicate the weakness, as also the strength, of this curious but rather wearisome book. Thus we may possibly be excused from following it to the close, chapter by chapter,—from taking up the tale of Madame de Sablé and Voiture,—from glancing at the peep into another world, which the name of Arnauld de

Corbeville opens to us,—one of the great Arnaulds, whose position in the Jansenist and Jesuit controversy was so remarkable,—a family, nevertheless, which never seems to have willingly quitted its hold on the refinement and royalty of France,—never to have laid down its arms of "aristocratic connexion" as weapons which devout people might bring to bear against other devotees from whom they were in discord. Neither will we halt at Mdle. de Scudéry's own romance,—if romance there was in her tender and exalted friendship with Pellisson,—with his poem in homage to her, whom he called *Artélie*.

With one figure in the procession of notoriety we should have liked to linger, Madame Cornuel, the wit; but even she comes out bleached of colour in the pages of M. Cousin, and the foot-note devoted to a small collection of her sayings contains merely the oldest of old stories, from the *Menagiana* and the *Séviigné Correspondence*. Perhaps, however, as Mdle. de Scudéry is the ostensible heroine of this book, it is only just to allow the tiresome, polite, super-refined lady to speak for herself. M. Cousin has disinterred from the collections of Conrart half-a-score of her letters, one of which we will attempt to present. There may be readers not averse to tedious talks, ("tedious" being not always synonymous with "stupid")—who have borne patiently with the Hertford and Pomfret Correspondence,—nay, even, have been able to pick a grain of gold out of the collection of epistles by "the Swan of Lichfield," which so appalled Miss Seward's executor, Sir Walter Scott. Such may have patience with what follows:—date, Avignon, November 27, 1644—person addressed, the *Arion* of Henry the Fourth's festival, Mdle. de Paulet, the fascinating:—

Mademoiselle,—Despite the popular opinion that 'tis sweet to narrate by-gone perils, I will only tell you, with the greatest brevity, that we twice believed ourselves about to be wrecked on the Rhone,—fearing lest, as you have a sensitive imagination and a delicate heart where your friends are concerned, you might have a feeling of pain about an accident which did not happen, and which now cannot happen to those who are determined not to return by that tiresome river. It is not that I have not found on its banks that which could impart amusement and pleasure,—for you must know, Mademoiselle, that on my brother and self taking a walk one evening, when we arrived early enough at our night quarters, he pointed out to me, at the place where we were, traces of the valour of a person in whom you take a great interest. The hotel in which we were lodged was but an old ruin of a place—in which, latterly, some of the half-broken doors have been restored—at the feet of a large rock, and in the midst of a heap of destroyed buildings, where the vestiges of a town are scarcely discoverable. This savage retreat, however, did not tempt me to murmur against those who have made it what it is. On the contrary, as these death-like ruins are eternal monuments to their glory, I suffered without complaint the whole inconvenience of so bad a lodgment, owing only to the thought that *le Poussin*, which is the place where we were, had been formerly taken by M. d'Aiguebonne [a connexion of one of the Rambouillet circle, *Ed.*], whose second M. de Lesdiguières on that occasion. The host with whom we were—a man who has sufficient intelligence, considering his station—narrated to us so many wondrous things in his conduct and courage, on the taking of the place, as gave room to believe that, had he done the feat in the ages when statues were set up to those who did great things, we should have found *his* on the banks of the Rhone. Of this, Mademoiselle, I have thought it my duty to apprise you, since that it could not be displeasing to you to say to you that if M. de Chaudbonne [the younger brother, *Ed.*] can pass legitimately for a Saint of the new Rome [thus was styled the Hôtel

Rambouillet, Ed.), *Monsieur*, his brother, might have been a hero of the old one. But, to depart quickly from a river to which I wish no more to return, let me tell you that on arriving here the first thing that I saw, on putting my head out of the window was M. de Berville, who was living on the other side of the street, and who was on the point of departing for Aix. My brother saw him on the spot, but as good manners precluded my doing as much, as he did not pay the compliment of inquiring for me, though only four steps distant, it will not be till I get to Marseilles that I shall see him, if, out of consideration for you, he pays me this courtesy. To conclude, Mademoiselle, I cannot forbid myself from saying, that having been to visit the tomb of the fair Laura, which is in the "Observantias," here my brother found an old friend in a monk, who invited him earnestly to take an apartment in their convent [*qy.* monastery, Ed.], and who proposed that I should hire one bordering on their cloister, with the privilege (supposing the Superior made no objection) to take the air in their gardens, which are very full of orange-trees. I leave you to imagine, Mademoiselle, whether or not I was surprised by such a politeness, offered four steps from a house where the gentlemen of the Inquisition were dwelling. This good monk, after having shown me the tomb of Laura, and recounted the loves of Petrarch, fished out for me ("*me fait quérir*") a leaden box, in which is a medal with the face of that beauty, and where, too, are verses in the handwriting of Petrarch; others by Francis the First, who caused the tomb to be repaired. But what is the most extraordinary is, that these good fathers keep this box in the same place where the relics are kept, and which serves the altar. Yet this is on the Pope's ground, and, as I have already said, four steps distant from the Inquisitors. I leave you to imagine the frame of mind in which Ladies should find themselves in a place where monks of the most orderly quality thus comport themselves. All in good time [to use Mrs. Piozzi's favourite phrase, to the "*Tout à bon*," which seems to have been no less habitual to the authoress of "*Le Grand Cyrus*," Ed.],—there is something so pleasant in this, that one must see to believe it; since, for me, who have never encountered them [the monks, Ed.] save in church, I could not imagine how they might behave in society. Principally, however, it is remarkable that in all Avignon I have not seen more than three kerchiefs to more than some thousand women whom I have seen *en dévotion* [at church, Ed.], and what is more surprising still, that I have not seen a single throat. Therefore, I must believe that only those who have a throat hide it,—and that it is to mortify themselves that those who have no throat expose themselves in a state regarding which there can be no dispute. But let me not fancy that such trifles as these engage you. Forgive the liberty of a person who lives in constraint without you, and only fancies herself clever and sprightly when she writes to you. * *

The above letter may not altogether confirm M. Cousin's position in regard to his heroine, and the person she represents,—namely, that their society was impeccably "chaste," as well as unquestionably "noble"; but it is characteristic, both of its writer's essenced formality, and of the freedoms of the world to whom that writer spake. M. Cousin's book, as we have said, is curious, and with small question trustworthy. It might have been made brilliant, in place of being, as it is, solidly, respectably, hopelessly dull.

Reports of the Imperial Russian Mission at Peking—[*Arbeiten der Kaiserlich Russischen Gesandtschaft, &c.*] Vol. I. (Berlin, Heinicke.)

IN the opinion of Dr. Carl Abel and Herr F. A. Mecklenberg, who have translated these Reports from Russian into German, every one is aware that at Peking there are two Greek Churches, which were founded by Russian prisoners in the seventeenth century, and have been the occasion of a perpetual series of missions from

the Empire of the Czars ever since their foundation. The missionaries, models for others of their calling, have not only looked after the orthodoxy of their co-religionists, but have done their best to make themselves acquainted with the language and manners of the Chinese, with whom they have always had free intercourse, remaining completely unscathed by the persecutions which drove the missionaries of the Roman Church from the Celestial Empire.

In the 'Reports,' of which the First Volume is now published in German, the members of a recent mission state the results of their Chinese experiences. So various are the subjects of which they treat, that the collection might not inaptly bear the title, "Chinese Miscellanies." I. Sackanoff writes a paper on the state of landed property in China, from a period which the human memory shudders to approach, with an appendix on the system of square-measure adopted in that country. V. Ewlampii translates from the Chinese the report of a Committee which, in obedience to an Imperial decree, issued in April, 1854, took into consideration the subject of assignats, and came to the conclusion that the introduction of this form of money had been beneficial both to the people and to the crown. P. Zwebthoff (since deceased) has been a most liberal contributor, furnishing two papers on 'Christianity in China,' a multitude of extracts from a native book on the domestic usages of the Chinese, a description of Japan in the last century, and an account of the philosophical sect of Da-oss. A record of the events that occurred at Peking on the fall of the Min dynasty has been compiled from documents of the period by M. Chrapowizki. With a more decided interest for themes of practical utility, the Archimandrite O. Palladius discourses of the communication by sea between Thian-zin and Shang-hai. I. Goschkewitz describes Hong-Kong in the capacity of a Russian traveller, and also explains the mysteries of the Chinese Abacus. O. Hilarius historically surveys the relations between China and Thibet; and W. Gorski inquires curiously about the leader of the present dynasty and the origin of the name Manchu. Many, indeed, have been the fields of investigation and industrious have been the labourers.

The paper on landed property in China may be selected from the rest as furnishing a curious episode in the history of agrarian distribution, and conveying a moral useful beyond the precincts of the Celestial Empire. In certain good old times, the surface of Chinese soil was divided into squares of equal dimensions, which we may call *communes*. Each of these was, by an obvious process, subdivided into nine squares, of which the one in the centre belonged to the Government, while the other eight were occupied and cultivated by as many families. The occupants also assisted in the cultivation of the Government share, or rather of four-fifths of it, for the remaining fifth was assigned in equal portions to the eight families to be used as gardens. Bodily vigour was, however, a *sine quâ non* in the landholder. He received his portion at the age of twenty, and resigned it at sixty to some more robust relative, who was bound to maintain him for the rest of his life. Circumstances—such, for instance, as the quality of the soil—often varied the extent of the grant,—so that it is, after all, doubtful whether we are merely describing an unapproachable ideal of the "Gun-tjan" system, as it was called, or whether China was actually ruled into such a neat chess-board as the description seems to indicate. The produce of the middle bits in each square constituted the whole revenue of the Government.

Whatever its defects might have been, the

old system was tenacious of life, enduring for upwards of 2,000 years. Yu the Great, who came to the throne (errors excepted) in 2205 B.C., and first made it hereditary, found "Gun-tjan" firmly established; and it was not till about 350 B.C. that the keen-scented politicians of the Celestial Empire began to sniff out imperfections. While the dynasties of Hia, Tang, and Tcheu sat firmly in the seat of power, firm also was the ancient communism; but when the Tcheu tottered—through the conversion of the great vassals of the Empire into petty kings—the lords of the land discovered that the middle bit in that very pretty square was anything but a lion's portion. Political difficulties rendered additional resources indispensable, and when Confucius, who lived in the troublous times, told one of his rulers that the imposts might be increased sixteenfold, his opinion was heard with infinite delight.

The system of "Gun-tjan" was associated with a system of feudalism; the occupiers of the squares holding their land of an immediate lord, while the Emperor was at once the father and suzerain of all. The great fiefs are talked of as so many kingdoms, and in each of them the old plan probably assumed different aspects. In the domain of the Tzin those inconveniences, which naturally flow from Communism, the check to enterprise and the sacrifice of the industrious to the idle, were felt to an extraordinary degree, for the land was thinly populated, and the people being content to batten on their own comfortable little squares, much valuable soil remained untilld. On the other hand, the neighbouring domains of Chan, Tchao, and Wei, suffered from extra-population.

To politicians of the present day, the problem offered for solution by this state of affairs will not seem very intricate; but when, in 350 B.C., the Minister, Shan-Yan, contrived a plan by which the domain that had too many people discharged its superfluity into the domain that was in want of labour, great was the surprise expressed at the bold innovator's reckless disregard of venerable institutions. The plan itself seems to have been simple enough. The occupant of the soil was converted into its possessor, the communistic arrangement was broken up, and "property," in the full sense of the word, became the order of the day. It was in the domain of Tzin that the innovation began, and when a prince of the house of Tzin towered above the rest of the petty kings, and again restored unity to the Empire, the system of private property was soon adopted throughout the whole of China.

The Socialists and Communists of Europe will not be displeased to learn that the "bright idea" of Shan-Yan brought with it a world of troubles. When first it was put into practice population was scanty and land was abundant, so every one could take a slice of the latter; but when population increased, and migration had become impossible, the difficulty between property and pauperism, so well known in the Western world, asserted itself in China. A tedious revolution, that lasted from 255 B.C. to 202 B.C., and placed the Han dynasty on the throne of the Tzins, increased the misery of the people. The poor were compelled to sell their land to the rich in order to obtain the necessities of life, and ultimately the soil was in the hands, neither of the Emperor, as father of his people, nor of industrious agriculturists, but in those of great landowners, who did nothing, and lived luxuriously amid the general starvation. These farmed out their property, taking half the produce for rent; and the poor farmers, not being able to live under this arrangement, were reduced to such a strait that they gave up themselves and their families as perpetual

bondsmen to the liege lord. The Government attempted to alleviate the general distress by gratuitous grants of uncultivated land and remission of taxes, covering the loss to the treasury by that most doubtful expedient, the sale of offices and dignities. Naturally enough, however, these measures proved utterly fruitless; misery went on increasing, till at last people began to look upon a restriction of the old communistic plan as the sole remedy for the growing evil.

The same difficulties that beset Agis and Cleomenes, when they endeavoured to revive the institutions of Lycurgus, stood in the way of the proposed reformation. If the poor would be delighted, the wealthy would be disgusted by a revival of the old plan, and a rebellion would be the necessary result of the supposed panacea. For a few gentlemen of the literary profession this consequence had no terrors. With a fine Machiavellian feeling, they proposed that Government, by means of secret agents, should in the first instance stimulate the wealthy to insurrection, and then seize their lands on the plea of confiscation.

The Government, however, was indisposed to commit the violent act implied in the revival of the common lands, until, in the year 10 A.D., the minister Van-Man (a sort of Chinese Pepin) usurped the throne of the Han dynasty, and, to conciliate the poorer classes, issued an edict that would have given pleasure to Gracchus Barbov himself. By this edict all property in the soil was vested in the Emperor; occupation of land was confined to a strictly appointed limit, and the sale of it was absolutely prohibited. The penal part of the decree is stringent enough:—"Whoever doubts the wisdom of these measures shall be banished; whoever acts in opposition to them shall be put to death." Alas, for the Communists! In about three years the edict was revoked by the very Emperor who had issued it!

The old plan was, however, not to be so easily thrust aside, and the Chinese mind having pondered over it for some three or four centuries (a mere half-hour with Celestials), it again made itself conspicuous in the period of the Zsin dynasty, clothed in an entirely new form. Persons were classed according to their years, and allowed to occupy land in proportion to their measured capabilities. A first-class man ranged from 16 to 60, the second-class comprised all above and below this limit, who were only intrusted with half the quantity of land. Thus, when an old gentleman had attained the age of 61 he retired from the first class on a sort of half-pay, and settled down with lads of 15. The practical application of this ingenious notion seems, however, not to have gone beyond a few experiments.

Under the foreign dynasty of Wei, which governed the northern part of China from 385 to 557 A.D., a more successful attempt was made to effect an equal division of land. A classification of persons according to years was made, and, in accordance with this classification, a distribution took place every year, the property of the deceased reverting to the Government, as the real owner of all arable land. That the ownership of the Government might not be reduced to a nullity, a limit was set to the propagation of trees, plantations being deemed the property of the occupant. When the number of occupants became too great for the distributed lands, a removal to uncultivated districts was allowed; and if that could not be agreed upon, a conversion of tree plantations into corn-fields.

Even persons of rank, princes, and kinsmen of the Emperor were subjected to the general rule, though their share in the soil was large in pro-

portion to their dignity; but the Wei dynasty did not venture on the wholesale confiscation attempted by Van-Man. No one, who already held land beyond the prescribed limit, was compelled to part with it, but when an alienation took place the law was in force. The landholder could not indefinitely reduce his estate by sale, nor could others attain more than the appointed quantity.

Under the Tan dynasty, which reigned from 619 to 907 A.D., the system was further developed and applied to the whole of China, which had again become united under the preceding dynasty of Sui. By the law, as it now stood, every head of a household, without distinction of age or sex, was the permanent possessor of a fixed quantity of land, while those who were capable of labour were the temporary occupants of an additional portion. Strange to say, this was devoted to the cultivation of trees, the very species of agriculture that in the time of the Wei dynasty had made the occupant the owner of the soil. When the family of a deceased householder was too poor to bury him by other means, or when a migration to another village was contemplated, a sale of the land held in permanence might be effected, but purchase beyond an appointed limit was illegal.

Complete as the system now became, even in details which we have not enumerated, it was once more found impracticable. The rich easily evaded the law by holding lands to any extent in the names of their indigent neighbours, or by seeking purchases really for themselves, but nominally for their own relatives. At last the interest of the Government in the division of land ceased through the grand discovery that other property besides the fat soil was susceptible of taxation. In 780, while the Tan dynasty was yet on the throne, an unsatisfactory state of the treasury led to the publication of an edict, by which a property-tax, applicable to the commercial profits, was established, and a free trade in land was one of the necessary consequences. No attempt has been made to return to the old system since that year, which thus brought to its close one of the most tedious political experiments ever recorded.

OUR LIBRARY TABLE.

The British Raj contrasted with its Predecessors: and an Inquiry into the Disastrous Results of the Rebellion in the North-West Provinces upon the Hopes of the People of India. By Dosabhoj Framjee. (Smith, Elder & Co.)—This essay, dedicated to Sir Jamsetjee Jeejeebhoy, and introduced by a few words of recommendation from Col. Sykes, was originally published at Bombay in November last in the Gujarati and Marathi languages. The sale was so considerable that "the author was enabled, after paying the expenses of printing, to contribute upwards of 75*l.* to the relief fund for the sufferers from the mutiny." We must say that this liberality is most creditable to the author, and proves that his practice agrees with the generous and correct sentiments he expresses throughout his essay. His efforts in the cause of English supremacy in India, that is, in the cause of true philanthropy and the real interests of mankind, are indeed by no means without their value. In such a cause the voice of a native of India must have more weight with natives of India than the pleading of a European, however great his attainments. We therefore wish well to this publication; and if we note errors in the comparison between English and Muhammadan rule it is in no carping spirit. At p. 19, "the reign of Hoornayoon" is introduced in such a manner directly after the mention of Shah Jahán that it seems as if the author were alluding to the Emperor Humáyún. Now this Emperor was remarkable for clemency to his brothers, whereas the cruelties cited were perpetrated by Humáyún Sháh, a king of the Dakhan,

and a personage comparatively of little note. The distinction should have been marked, especially as the latter king was surnamed Zálím, or "the Tyrant," showing that such actions were uncommon. Candour compels us to say that what follows in a subsequent page regarding the native monarchs of India, that they "never sought to encourage commerce or the construction of public works for developing the wealth and resources of the country," is not altogether true. Our author overlooks the famous canal made by 'Alí Mardán Sháh when he speaks of the reign of Shah Jahán, the public roads from Bengal to the Panjáb constructed by Shír, and the thousands of wells, tanks, and dams made all over India. A little revision in these matters would improve the essay.

The Happy Isles: Poems. By the Rev. Garnons Williams, B.A. (Saunders & Odey.)—The "happy isles" of Mr. Garnons Williams are the British Isles, and the poet who rings their praises is more noisy than Tyrtæus. In a pyrotechnic ode on the Anglo-Indian Empire he encrusts every line with diamonds, rubies, pearls, amethysts, and opals, piles up mountain pomegranates and mangoes, with more silks, muslins, and shawls than would have encumbered a quay of Venice, and such accumulations of myths as betray the newness of his Orientalism. The burden of the song, however, is thoroughly English, so that it would be ungenerous to complain of the furious energy with which Mr. Williams grinds his rhymes. We are bound, notwithstanding, to suggest that a very little of this minstrelsy is more than enough.

A Dictionary of Photography. By Thomas Sutton, B.A. (Low & Co.)—A book of this kind was required, and Mr. Sutton has well supplied the want. To the amateur in the art of photography, or in chemical science, this Dictionary cannot but prove exceedingly useful. After a very careful examination of the work, we are bound to state our conviction that the definitions and the descriptions are given with great care, and are in every way reliable. We do not know a better book to put into the hands of either the learner or the successful photographer. You turn at once to the thing you require, and generally the information given is as full as, for all ordinary purposes, can be required. We should have been better pleased if Mr. Sutton had been a little less dogmatic than he is when writing on some of the modern theories of light, chemical action, &c. No one can object to any writer earnestly supporting that view which he conceives to be the correct one; but he is not justified in stating that every "author is but imperfectly acquainted with his subject" who ventures to hold contrary opinions. Indeed, Mr. Sutton himself is not quite consistent in the way in which he puts some of these hypotheses before his readers. With this exception, the 'Dictionary of Photography' has our warm recommendation.

The Elements of Inorganic Chemistry. By F. C. Buckmaster.—This little work has been written chiefly for the senior classes in trade-schools,—and the utility of such a book cannot be denied. A man who has struggled through the difficulties of self-education, who has acquired knowledge by the aids of the mechanics' institution, is qualified to construct a guide for those who are similarly situated. We are informed by Mr. Buckmaster that this has been his condition,—and the result of the experience thus gained is shown in the production of this book, which is arranged in a simple manner, will be readily comprehended, and thus cannot but prove useful.

Roberts's Chester Guide, with Forty-six Engravings, and an Illustrated Plan of the City. (Chester, Roberts.)—This Guide has nothing to distinguish it from ordinary books of the same class, except in the plan of the city and environs, in which the ancient city boundaries are very clearly and accurately defined.

Roman Sepulchral Inscriptions; their Relation to Archaeology, Language, and Religion. By John Kenrick. (J. R. Smith.)—Out of the combination and, probably, some amplification, of two papers read before the Yorkshire Philosophical Society, this volume has been produced. It shows some extensive and diligent reading, and will prove an agree-

able book to those who are as yet unlearned in the literature of Pagan tombs and Christian catacombs.

Doubts concerning the Battle of Bunker's Hill (Boston, Munroe) is a misleading title. The volume, by Charles Hudson, is nothing more than an argument on religious scepticism.—*The Theory of the Sabbath*, by J. M. Pollok (Paton & Ritchie), discusses an old topic in an old fashion.—*Short Notes on the Book of Common Prayer*, with an Introduction by the Rev. J. Thompson, A.B. (Wertheim), are historical and explanatory.—In *A Lecture on the Institution of Wesleyan-Methodism* (Hamilton), Mr. Henry H. Fowler pronounces vigorously the eulogium of his church.—The Rev. F. L. Colville, M.A., in *A Few Observations on Education, addressed to Parochial Teachers*, (Warwick & Son), offers a variety of pointed suggestions to a class very much in need of guidance.—*The Clerical Directory for Ireland*, "compiled from original and authentic documents," by J. B. Oldham (Dublin, Madden & Oldham), is a useful and well-executed manual.—From the same publishers we have a little collection of *Original Hymns, and a Few of the Psalms paraphrased*.

LIST OF NEW BOOKS.

A B C of Photography, 10th edit. 12mo. 1s. 6d.
Annual Register, The for 1857, Vol. 59, svs. 15s. 6d.
Armstrong's The Warhawk, 8vo. 2s. 6d.
Bing's Collection of Public Statutes, 21 & 22 Viet. 1-54. 15mo. 4s. 6d.
Bohn's Strand Lib. 'Yeander's Church Hist. V. 8, 2 Pts. 2s. 6d. ed.
Bohn's Philol. Lib. 'Lowndes's Bibliographer's Man. Pt. 3, 3s. 6d.
Bohn's Illustrated Library, 'Holbein's Dance of Death, by Douce and Dibdin, 2s. 6d. ed.
Cockton's Valentine Vox, the Ventriloquist, new edit. 8vo. 2s.
Cunningham's Apocalyptic Sketches, Vol. 3, new edit. 8vo. 6s. 6d.
Dakshin's Selections and Poems, royal 8vo. 1s. 6d. ed.
Diarmid's 'Curiosities of Literature, new edit. Vol. 2, 8vo. 4s. 6d.
Facts for Everybody, post 8vo. 3s. 6d. ed.
Fly-Leave, a Book for the Churches, by Aristarchus, 8vo. 1s. 6d.
Fullon's The Nine and the Countess, new edit. 8vo. 2s. 6d.
Gangee's The Veterinarian's Vade Mecum, 8vo. 10s. 6d.
Gatty's Proverbs Illustrated, 2nd edit. 16mo. 2s. 6d.
Gavazzi's Recollections of the Last Four Popes, 8vo. 2s. 6d. ed.
Gordon of Duncuirn, 2 vols. 8vo. 12s. 6d.
Harding's Elementary Art, 4th edit. folio, 77s. 6d.
Insurrection, a Poem, by R. S. R. 8vo. 1s. 6d. ed.
Lehahn's Exercises in German, with Vocabularies, 12mo. 2s. 6d.
Madden's United Irishmen, Lives, &c. 1st ser. 2nd ed. 8vo. 10s. 6d.
Mancil's Limits of Religious Thought—Rump. Lec. 1855, 8vo. 1s. 6d.
Milly's Old English Gentleman, 4th edit. 8vo. 2s. 6d.
My Lady, a Tale of Modern Life, 2 vols. post 8vo. 21s. 6d.
Nelson's Handbook to Edinburgh, Maps and Plates, 8vo. 2s. 6d.
Parole's 'Calous Wife, new edit. 8vo. 2s. 6d.
Parlour Library, 'Jerrold's The Disgrace to the Family, 2s. 6d.
Pulphampon's Memoir, Letters and Diary, post 8vo. 10s. 6d. ed.
Pulpit Library, Vol. 8, 'Spurgeon's Sermons, 8vo. 2s. 6d.
Railway Library, 'The Manoeuvring Mother, 2s. 6d.
Run and Read Library, 'Roe's True to the Last, 1s. 6d. bds.
Shorell's Tradesman's Calculator by Briggs, n. e. by Hooks, &c. 1861.
Soyer's Modern Housewife, 34th thousand, 8vo. 7s. 6d. ed.
Story of Joseph and his Brethren, 8vo. 2s. 6d. ed.
Symmers's Sol-Fa Method of Singing at Sight, 8vo. 2s. 6d. ed.
Taylor's Bayes and Sellers' Calculator, new edit. 8vo. 6s. 6d.
Taylor's Local Government Act, 1854, 12mo. 9s. 6d.
Tweedie's Daily Duty, illust. 12mo. 1s. 6d. ed.
Walsh's English Cookery Book, 8vo. 2s. 6d. half-bound.

AMERICAN IMPORTATIONS.

American Association for the Advancement of Science, Proceedings of, Vols. 10 and 11, 8vo. 30s. 6d.
Carey's Principles of Social Science, Vol. 2, 8vo. 14s. 6d.
Hempster & Reakley's Manual of Homoeopathy, 8vo. 10s. half-bd.
Logan's (Sir W. C.) Christian's Own Bible, 8vo. 2s. 6d. ed.
Loomis's Analytical Geometry, 8vo. 9s. 6d.
Loomis's Tables of Logarithms, 8vo. 6s. 6d. ed.
Mottley's Rise of the Dutch Republic, 8vo. 2s. 6d. ed.
Squier's States of Central America, 8vo. 15s. 6d.

[ADVERTISEMENT.]—"IS IT A FACT?" Is it a truth—a reality—a thing to be relied upon? Such are the questions daily asked upon all sorts of topics, great and small. Next to the anxiety to grasp a fact, is the difficulty of finding it. Hence the necessity of the new work, 'FACTS FOR EVERYBODY,' illustrated with 1,000 Engravings. This book is a perfect encyclopedia of useful knowledge, at once cheap and reliable: it supplies accurate information upon almost every subject of inquiry. "As a volume of current facts—facts from the Arts, Sciences, and Literature—facts from Commerce and Manufactures—facts from Anatomy and Physiology—facts from the Garden and the Field—and facts from all sources and for everybody—no work has ever appeared more worthy of universal purchase." Price 3s. 6d. Frontispiece and Title designed by Harvey. Crown 8vo. cloth. Now ready.—London: WARD & LOCK, 158, Fleet Street.

THE COMET.

The comet is still a beauty and a mystery to wondering millions. For the last ten days the best views of the celestial stranger have probably been obtained in England and the countries in her latitude. The writer of these words has had the good fortune to observe it from Cadiz, Lisbon, and the sea—and sometimes, especially at early morning, under brilliant conditions of light and atmosphere—but he has never seen it under an aspect so splendid as it presented on Sunday evening last in the neighbourhood of Hampstead. Astronomers are as much surprised as the multitude, and we have heard one of the most eminent declare that the comet of 1858 surpasses in beauty and splen-

dour the famous comet of 1811. We hear both from the Garonne and the Guadalete that some influence, cometary or other, is visible in the vineyards. We suppose for the next twenty years we shall have comet sherries and comet port.

Mr. Hind supplies the most available popular information on the subject, and we make no apology for transferring to our columns a letter which he has addressed to the *Times*. Mr. Hind writes:—

"The following places of the comet of Donati have been obligingly furnished by Mr. Farley (who is well known to be one of the most expert calculators of the present day), and are founded upon an orbit which, to insure accuracy, he has computed in duplicate with me from observations extending to the 21st of September, and including a series taken with the equatorial of the Liverpool Observatory, for which I am indebted to the kindness of Mr. Hartnup, the able director of that establishment. It may be fairly assumed that the ephemeris will nearly represent the course of the comet until it finally sinks below the horizon in Europe; and I transmit it, in the hope that daylight observations may be secured by those who are provided with good equatorially-mounted telescopes.

AT GREENWICH MEAN NOON.

	Right Ascension.	Declination.	Comet sets in	
			London.	h. m.
Sept. 28	12 46 30	32 30 9 N.	9 58 P.M.	
Sept. 29	12 46 19	31 30 6 "	9 50	
Sept. 30	13 6 38	30 21 6 "	9 43	
Oct. 1	13 17 26	28 53 4 "	9 36	
Oct. 2	13 28 43	27 19 9 "	9 28	
Oct. 3	13 40 22	25 13 4 "	9 20	
Oct. 4	13 52 24	22 59 8 "	9 11	
Oct. 5	14 4 41	20 30 0 "	9 2	
Oct. 6	14 17 11	17 44 3 "	8 53	
Oct. 7	14 29 45	14 41 0 "	8 44	
Oct. 8	14 42 19	11 31 0 "	8 35	
Oct. 9	14 54 47	8 8 0 "	8 25	
Oct. 10	15 7 5	4 38 2 "	8 15	
Oct. 11	15 19 7	1 5 4 "	8 6	
Oct. 12	15 30 49	2 26 6 S.	8 0	
Oct. 13	15 42 7	5 54 2 "	7 46	
Oct. 14	15 53 0	9 14 5 "	7 35	
Oct. 15	16 3 26	12 25 1 "	7 25	
Oct. 16	16 13 23	15 24 4 "	7 14	
Oct. 17	16 22 52	18 12 1 "	7 3	
Oct. 18	16 31 50	20 47 2 "	6 52	
Oct. 19	16 40 22	23 10 0 "	6 41	
Oct. 20	16 48 26	25 20 9 "	6 30	
Oct. 21	16 56 4	27 29 8 "	6 19	
Oct. 22	17 3 16	29 10 3 "	6 7	

The comet will arrive at its least distance from the earth about midnight on the 10th of October, when we shall be separated from it by rather over 51,000,000 miles. Its maximum brilliancy will be attained the day previous, when the intensity of light will be twice as strong as at the present time. It is, therefore, obvious that during the absence of moonlight in the evening hours for the next ten days or upwards the comet will form a splendid object in the western heavens. On the evening of October 5th the nucleus will make a near approach to Arcurus, the principal star in the constellation of Bootes, which, according to the above calculations, will be near the border of the tail during the early part of the evening, and as it descends towards the horizon may possibly be enveloped in that appendage. If the sky be clear, this close approach of the comet to so conspicuous a star will doubtless prove a very interesting phenomenon. At six P.M. their distance will be little more than one-third of a degree. It is not probable that the comet will be visible in this country after the end of the third week in October, unless a few daylight observations be subsequently procured. We must then leave it to the care of astronomers in the Southern Hemisphere, and more particularly to that of Mr. Maclear, at the Royal Observatory of the Cape of Good Hope, who never allows an opportunity to pass, wherein his position enables him to render any service to the science. When the Cape observations are combined with those taken in Europe up to the middle of October, we may perhaps be able to assign a period of revolution to this fine comet, though at present it must necessarily be open to conjecture. The general telescopic appearance of the comet has not materially altered, but some of its features have come out more distinctly, as was to have been expected. In a somewhat hazy sky last evening the apparent length of the tail was about 12°, corresponding to a real length of

16,000,000 miles. As usual in great comets, the tail is very visibly curved in the opposite direction to that of the motion of the nucleus. After it is lost to view in Europe the comet will traverse the southern extremity of the constellation Sagittarius, and thence pass through Telescopium into Indus, where it will be found about Christmas, not far from the star α in Pavo. It will remain in the same constellation during January and part of February, slowly approaching the principal star in Toucan, and, indeed, will continue in that part of the heavens until it has nearly completed its next revolution round the sun, and again presents itself to the gaze of another Donati a few hundred years hence."

OUR WEEKLY GOSSIP.

Glasgow looks with a pardonable envy on the two Edinburgh monuments to Burns and Scott. Glasgow has erected a memorial to the romancer, why not to the poet? As the centenary of Burns's birth approaches, this question grows more pressing; and we are glad to find enthusiasts ready with their time, their siller, and their appetites against that date. Lord Eglintoun has given a sort of form to a floating sentiment. A Committee has been named. A list of stewards is being drawn. A dinner first—a monument afterwards; this is the order of ideas,—a sagacious, or at least a pardonable, arrangement of ideas; and we desire for the Committee every success in their work.

The account of the inauguration of Newton's statue at Grantham on the 21st of last month will be read with interest. But there is one point about it which seems to have been rather misconceived. In some local,—aye, and even in London,—comments,—there is an assumption that this statue is a kind of tardy recognition of Newton's merits; as if England never paid Newton due honour until Grantham bestirred herself to raise a statue. Now, though we may be inclined to admit that the Grantham district has been but slow to remember that Newton was born in it, and has until now taken no pains to proclaim and commemorate the honour thence accruing to itself, we altogether deny, as a matter of fact, that the country at large has shown any want of recognition of Newton's fame. What Grantham has done, praiseworthy as it is, has been done for itself. A much better Grantham monument to Newton was raised by Mr. Turner, when, in the collection for the history of that town, he published such materials in aid of Newton's biography as could then be found nowhere else. This book ranges the world, and every copy is a fount of information, by which Newton is better known: the Grantham statue remains fixed, and tells nothing but the place of Newton's birth, a matter with which that place has much more to do than either the world at large or Newton's memory. Honour to whom honour is due: Grantham has done itself honour.

The Ray Society held its Fifteenth Annual Meeting during the late Session of the British Association at Leeds. Prof. Owen, the President of the Association, occupied the chair. The Report stated that Prof. Williamson's work 'On the British Foraminifera' had been distributed to all subscribers for 1857. The plates of Prof. Huxley's work 'On Jelly Fishes' were exhibited, and it was announced that the work would be shortly distributed to the members for 1858. For 1859, the Council promised Dr. Carpenter's work 'On the General History and Structure of the Foraminifera,' and if the members increased sufficiently Dr. Bowerbank's work 'On British Sponges.' The Report also announced that the Council would publish a translation of Hoffmeister's work 'On Cryptogamic Plants,' and that they were not without hope that they should have the honour of giving to his countrymen a complete edition of the works of the late Robert Brown. The usual complaint was made of subscriptions in arrear; these amount to about 800l., whilst the liabilities of the Society are about 500l., and the stock of books in hand for the past year amounts to about 3,000 volumes.

Madame Ida Pfeiffer, the intrepid tourist, has arrived at Vienna, in a rather suffering state of health. She intends to spend the remaining part

of her days in deep retirement and rest, at her brother's, in Wiener Neustadt.

The annual conference of the Hampshire and Wiltshire Education Society will take place at Salisbury, on the 6th of October. Mr. Estcourt will preside.

Mr. and Mrs. Howard Paul, in an evening entertainment which has hitherto escaped our notice, have given great satisfaction to Michaelmas holiday-makers. 'Patchwork' is a clatter of fun, frolic, song and impersonation, carried forward by performers of unflinching dash. Mr. Paul's Yankee is effective, and Mrs. Paul's Irish nurse and drummer-boy are admirable. Egyptian Hall has changed, but not diminished its attractions for boys and girls of all ages.

Mr. Thornbury sends a word or two of good-humoured addition to our notice of 'Every Man His Own Trumpeter.' He says—"Your review of my book was so flattering that I am sorry it should have been even in a small way marred by some inaccurate corrections of supposed inaccuracies. 'The Paella' I mention was, of course, not Voltaire's, but that of the fool-poet, Chapelaine's. The favourite butt of Boileau, 'Chillicric's fowling-piece,' was a mere jest at spurious antiquarianisms. The date of the origin of *cigarettes* I do not know,—but cigars were used by the savages of South America, long before even Columbus gave a new world to 'Castilla y Leon.' My absence in Spain prevented my writing this before. Your review reached me in the Alhambra."

The French Government seems to have neared the end of its direct war on letters, and we may now reasonably expect an improvement. A short time since, the gentleman who presided over public education in France—we abstain from writing his name, as he has now gone to his grave—decreed the abolition of the grade of Bachelor of Letters, as a preliminary qualification for inscription as a student in the Faculty of Medicine. The status of the Faculty of course declined. A less-educated order of youths entered. The glory of the profession was about to depart. Paris protested, Montpellier protested. At last authority has listened to the voice of Science; and a government which seems to court the censures and dare the laughter of Europe on behalf of the miracle at Lourdes, has consented, perhaps by way of balance, to restore the ancient forms of inscription in the Faculties of Medicine.

Death was once found in the pot, and now he has been detected in the snuff-box. Long ago, the destroyer was found in the snuff, but he has since that been discovered lingering in the box itself. In boxes lined with very thin lead, but especially in cases where the leaden lining is thicker, and which are much used by the Paris retailers, a chemical action takes place, the result of which is to charge the snuff with sub-acetate of lead. This result was suspected by Chevalier, and has been confirmed by Boudet of Paris and Mayer of Berlin, by long and careful experiments. The latter learned chemist traces several deaths and cases of "saturnine paralysis" to the patients having taken snuff from packets the inner envelope of which was thin sheet-lead, in constant contact with the powdered weed.

M. Mirès, it is said in the Paris journals, has bought of M. Paulin, the Paris publisher, 20,000 copies of the 'History of the Consulate and the Empire,' by M. Thiers, in order to distribute the same, as prizes, to the subscribers of the *Constitutionnel* and the *Pays*.

In Madrid a royal decree makes havoc in the college system of Spain. The chairs of living languages are suppressed, and practical science is to be pursued instead of English and French. The new cry in Spain, from Andalusia to the Pyrenees, is—mines and metals! The cry is, perhaps, not absolutely new, for your Iberian, blessed with the finest climate under heaven, has always neglected a prosy and prosperous agriculture for the more adventurous search for gold. But it has revived in our generation with full force. English capital is flowing into the land—only to be thrown into the Guadalquivir—and the natives are jealous. So they are going to study mining in their universities, and forget everything else. *Cosas de Españas*.

A contracting circle is still the figure within which our brethren of the Austrian press are condemned to labour. Politics have been prohibited since the Vienna insurrection, when Bem watched from St. Stephen's for the camp fires of the Magyars. Religion and Public Education have been withdrawn from their cognizance since Pope Pius inflicted his concordat on the empire. Art seems about to follow Politics and Education—for the press is now officially commanded to respect the theatrical and operatic managements on pain of the Kaiser's displeasure. Fancy the *Times* at Bow Street, charged with free comments on Robson, or the *Athenæum* dragged to Scotland Yard for disloyalty to Queen Gris! Even this would be less droll and surprising than the *Oesterreichische* in jail for quizzing the *Kar's Theater*. In London we have a thing or two to dream of besides plays and ballets; but Vienna is a city of Art. A false note in a waltz by Strauss's hand—a weak step in the *Pas de l'Ombre*—excites more tumult there than the news of a battle or the promulgation of martial law. And the press may no longer speak its mind on the tune of a song or the sprightliness of a dance! Poor Vienna!

We hear from Berlin that all doubt as to the demise of the naturalist, M. Bonpland, is now at an end. He died on the 11th of May.

Intelligence also from Berlin relates the death of Panofka, the veteran archaeologist, whose publications on the Etruscan vases were, together with Millingen's, the first to convey a just idea of the various styles of painting and drawing which enriched them. Tischbein and Millin perverted the outlines of the paintings they published by reducing them to the academic purity of form which David and Gérard had so insidiously laboured for. Panofka's interpretation of the subjects represented, although sometimes fanciful, were singularly learned, and he certainly introduced a new style of criticism upon these matters. His most popular work was, 'The Manners and Customs of the Ancient Greeks, illustrated by their Vase Paintings.' One of his earliest was the 'Vasi di Premio,' and he continued to the last to issue archaeological essays with numerous illustrations. Panofka had long contemplated an illustrated edition of Pausanias.

The friends of Berthold Auerbach's *Muse* will learn with pleasure that the poet's 'Deutscher Volkskalender' for 1859, has just appeared. It contains three tales in the well-known popular manner of the author, the first of which, 'Friedrich der Grosse von Schwaben,' is likely to please most. At all events it is the German village-tale for 1859. Frederick the Great, of Suabia, whom, in this pleasing little novel, we see in his cradle (just put into it by the Stork), and whom one of Ludwig Richter's accompanying woodcuts represents to us as the regular German "Wickelkind," is no less a personage than Friedrich Schiller, whose centenary birthday will be celebrated next year, on the 10th of November, throughout Germany.

Dijon has been re-naming her principal streets by the names of the most distinguished natives of that ancient city. The sculptor Rude, the holy Saint Bernard, the great Bossuet, the too sprightly Piron, the scientific Vauban, Rameau the musician, Prudhon the painter, and Marshal Vaillant, the Minister of War, are now commemorated in the titles which they give to the streets of their native Dijon.

We hear from Munich that grand preparations for the seventh centenary jubilee of the historical existence of that town were going on. The programme of the solemnities was as follows:—The first day, Sunday, the 25th of September, opens with divine service in all the churches of the capital; after that, a procession to the Tsar, and the laying of the foundation-stone of the new bridge there by the King, takes place. A new Asylum for the Poor is inaugurated on the same day, which ends with the representation, at the Theatre Royal, of a drama written expressly for the occasion, and entitled 'Fürst und Volk.' On Monday, at noon, the great festive procession of the Seven Centuries commences,—a spectacle which bids fair to be one of the rarest or most characteristic sights of this kind, by its splendour, as well as by its artistic arrangement and the historical truth of its costume. More

than 2,000 persons in costume take part in it. The procession closes with the Nineteenth Century, a deputation from which is received by the King in the Nibelungen-Saal. On the third day, Tuesday, the Magistrate of Munich holds a grand meeting in the town-hall, where, besides other civic solemnities, historical orations are delivered by two members of the Academy, viz. Prof. Franz Löher and Reichs-Archivrat Muffat. The Bavarian peasantry in their picturesque costume will arrive on rafts down the Tsar and the tributaries of that river, celebrating, on Tuesday, the anniversary of the battle of Sendlingen, on the battle-field itself. A grand banquet, in the Odéon, closes the festivities.

PROFESSOR WILLIAM FRICKELL.—LAST WEEK BUT TWO.—POLYGRAPHIC HALL, King William Street, Charing Cross.—TWO HOURS OF ILLUSIONS, previous to Professor Frickell's departure on a Provincial Tour. Every Evening at Eight; Saturday Afternoons at Three. Private Boxes, 3s. Guineas; Box Stalls, 2s.; Orchestral Stalls, 3s. 6d.; Amphitheatre, 1s. Places may be secured at the Polygraphic Hall, and at Mr. Mitchell's Royal Library, 24, Old Broad Street.

DR. KAHN'S ANATOMICAL MUSEUM, 3, Tichbourne Street, opposite the Haymarket. Open daily for gentlemen only.—Lectures by Dr. Sexton at Three, Half-past Four, and Eight o'clock, on important and interesting topics in connexion with Anatomy, Physiology, and Pathology (vide Programmes). Admission, 1s.—Dr. Kahn's Nine Lectures on the Philosophy of Medicine, &c., sent post free, direct from the Author, on the receipt of twelve stamps.

Patron.—H.R.H. THE PRINCE CONSORT.—ROYAL POLYTECHNIC INSTITUTION.—LECTURES ON CHEMISTRY, by E. V. GARDNER; ON NATURAL PHILOSOPHY, by Mr. J. L. KING; ON MUSIC, by Mr. THOMAS FIELD, assisted by Miss FERRIS.—THE ATLANTIC TELEGRAPH CABLE explained by Mr. KING with Specimen of Rowatt's New Cable.—THE LADIES' QUARTETT BAND daily, at a Quarter to Four, by the MESSRS. GREENHALL.—The Laboratory is open for Analyses, Pupils, &c., under the direction of Mr. E. V. GARDNER, Professor of Chemistry.—The Inaugural Meeting of the Evening Classes will take place on Monday Evening, the 11th inst. Persons desirous of joining are requested to attend. The Chair will be taken at Eight o'clock.—Open daily from Twelve to Five. Evenings, Seven to Ten.

MANAGING DIRECTOR, R. L. LONGBOTTOM, Esq.

SCIENCE

TWENTY-EIGHTH MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SCIENCE has held its great festival at Leeds, and we have only now to write its history. As usual, meeting, lecturing, dining, and even dancing went side by side with the more serious business of the Association, with a heartiness that spoke well for the spirit of the old Yorkshire hospitalities, but which never seemed to interfere with the morning work. The discourses have been more than usually brilliant. Of Prof. Owen's eloquence our readers judged last week. Of that of Dr. Whewell, Sir J. F. W. Herschel and Mr. Baines they will find illustration in their hands. The Sectional Reports are also full of interest. Aberdeen is, of course, fixed for the Meeting of next year, with an understanding in favour of Oxford and Manchester for the years next following. The Prince Consort will preside.

The following gentlemen were appointed as officers of the Aberdeen Meeting:—President, The Prince Consort. Vice-Presidents, the Duke of Richmond; the Earl of Aberdeen; the Lord Provost of the City of Aberdeen; A. Thomson, Esq., Convener of the County of Aberdeen; Sir J. F. W. Herschel, Sir D. Brewster, Dr. Robinson, the Rev. W. V. Harcourt, and Sir R. I. Murchison. Local Secretaries, Prof. Nicol, of Marischal College, and Prof. Fuller, of King's College, Aberdeen. Council of the Association, in addition to those entitled to sit on the Council *ex officio*, the following Members were elected:—Mr. Babbington, Mr. G. Bell, Glasgow; Mr. W. Fairbairn, Admiral FitzRoy, Mr. Gassiot, Mr. Grow, Mr. Horner, Mr. Hutton, Dr. Latham, Mr. Lyell, Mr. Miller, Gen. Portlock, Mr. Price, Mr. Russell, Mr. Rennie, Dr. Sharpey, Col. Sykes, Mr. Tite, the Rev. R. Walker, Mr. Webster, Lord Wrottesley, and Mr. Yates. Auditors, Mr. Hutton, Mr. Yates, and Dr. N. Shaw. General Secretary, Major-Gen. Sabine. Assistant Secretary, Prof. Phillips. General Treasurer, Mr. J. Taylor. The time for the Meeting at Aberdeen is not yet fixed, as it will depend on the presence in Scotland of the Prince Consort.

On Thursday morning the several Sections met in their own rooms, under their various Presidents. The opening addresses and general business are

reported below in order. We commence with the **Kew Report.**—

Report of the Kew Committee of the British Association.

Since the last Meeting of the Association, a set of Magnetical Instruments has been prepared at the request of the Council, the Royal Society, and the constants determined for the Expedition of Dr. Livingstone to South Africa. Capt. Bedingfield, R.N. and Messrs. Livingstone and Baines, who accompany Dr. Livingstone in this Expedition, received instructions at the Observatory in the use of the instruments.

At the request of Capt. Washington, R.N., Hydrographer to the Admiralty, similar instruments were prepared for the Oregon Boundary Commission, and instructions in their use were given at the Observatory to Capt. Haig, R.A., and Lieut. Darrah, R.E.

Detailed written instructions for both Expeditions, supplementary to those contained in the Admiralty Manual, were furnished by Mr. Welsh. Such instructions necessarily occupied the time and attention of Mr. Welsh and his assistants; but as, in the opinion of the Committee, instructions for the correctly manipulating with instruments with which gentlemen appointed to a particular service are not often previously acquainted, is an essential feature in the practical working of a physical observatory, the Committee have considered it desirable that such assistance should be afforded; and it will be in the recollection of the Council that, in their last Report, the Committee stated that several gentlemen, some of whom were connected with foreign Governments, had received similar instruction.

An application having been received from M. Secchi of the Collegio Romano, on the part of the Roman Government, for Magnetical Instruments, these instruments have been prepared at the Observatory and forwarded to Rome. They consist of an Observatory Bifilar Magnetometer and Balance Magnetometer, similar to those employed in the British Colonial Observatories, a Unifilar Magnetometer, and a Dip Circle.

Application has also been received from the Rev. Alfred Weld for Magnetical and Electrical Apparatus for the Stonyhurst College; these are in course of preparation, and Mr. Weld has received instructions in the use of the magnetical instruments.

Two Dip Circles by Barrow, furnished with Dr. Lloyd's apparatus for the total force, which were sent to the Observatory preparatory to their being forwarded to the Austrian and Russian Governments, were carefully examined and adjusted.

An extensive series of observations made with various dipping-needles and circles, have confirmed the results previously obtained at the Observatory as to the value of the Magnetic dip.

The Self-recording Magnetometers have been in regular action since the 1st of January, and have performed satisfactorily; some difficulty arose in the manipulation of the Balance Magnet, but this has been surmounted, and this instrument now performs with as much accuracy and delicacy in its action as either the Declinometer or Bifilar Magnet.

The Photoheliograph, erected in the dome of the Observatory, was fully described in the last Annual Report; it has been repeatedly at work since the beginning of last March, and excellent photographic pictures of the solar spots and facule were obtained. Certain alterations have been made by Mr. Welsh in order to regulate the time of exposure of the collodion plate to the sun's action; with these alterations the instrument gives very good results, but certain improvements in the arrangements of the secondary magnifying lens are under consideration, with the view of avoiding the depiction on the collodion negative of the inequalities of the glasses which compose it.

The Committee recommend that arrangements should be made for the appointment of a competent Assistant, who will undertake the taking of the photographs and the preparing of a certain number of copies for distribution to some of the principal British and Foreign observatories.

George Whipple has been engaged to assist in the general work of the Observatory at a weekly pay of ten shillings.

Mr. Beckley's arrangement of the Anemometer described at the Cheltenham Meeting of the Association has been adopted and carried out in an apparatus made by Mr. Adie for the East India Company. This anemometer having been mounted at the Observatory, remained for some time, and was found to perform satisfactorily; it was shown to many persons, and examined by Admiral FitzRoy, General Sabine, and Mr. Osler, members of the Anemometer Committee. Certain modifications since suggested by Mr. Beckley have been adopted in two instruments constructed by Mr. Adie for Admiral FitzRoy's department in the Board of Trade.

The verification of Meteorological Instruments has been continued on the same plan as in previous years. The following have been verified since the last meeting of the Association to the 1st of July:—

	Baro- meters.	Thermo- meters.	Hydro- meters.
For the Admiralty	75	126	—
For the Board of Trade	60	126	—
For Opticians and others	86	142	150
Total	221	208	150

Amongst the latter are included 50 barometers and 150 hydrometers for the United States, and 6 barometers and 6 hydrometers for the Portuguese Government.

Mr. Welsh is at present completing the Magnetic Survey of Scotland, for the expense of which £200 has been received by the Committee from the Admiralty.

The Committee find it desirable that the workshop of the Observatory should be furnished with a superior lathe and planing machine, authorized their Chairman to apply to the Council of the Royal Society for the sum of £150; this amount was immediately awarded from the Donation

Fund, and a very superior lathe, by Whitworth, and a planing machine have been purchased at a cost of £140 7s.

The present, as well as the former Annual Reports of the Committee, show the practical scientific objects for which the Observatory has for so many years been used, and at no former period was it in so effective a state as at present; the valuable tools that have by the liberality of the Royal Society been placed in the workshop, enable Mr. Beckley to repair and make apparatus and instruments of the most complex and delicate construction; much of this work would otherwise have been sent to different workshops in the metropolis, entailing not only great loss of time, but often a want of accuracy in the construction; the value of such arrangements in the Observatory can be easily appreciated by scientific observers.

On the 24th of last April, the Committee presented an estimate of the expenditure for the present year, a copy of which had been previously forwarded by the Chairman to the President, whose reply, addressed to General Sabine, the Committee now present as a part of their Annual Report.—

“Trinity College, Dublin, Dec. 7, 1857.”

“Dear Sabine,—I have received from Mr. Gassiot the Financial Report of the Kew Committee, which I hope may soon be laid before the Council. It appears from it that the expenditure of the Observatory is likely to increase with the increased activity of the establishment, while part of the income—that, namely, derived from the verification of meteorological instruments—will probably diminish in future years. I am not sufficiently acquainted with the working of the Observatory to say from my own knowledge, how far an augmentation of the existing staff is necessary. But if the Council should judge that it is—as stated in the Report of the Committee—they will have to consider from what *external* source provision may be made for the increased expenditure; for I presume that it will not be thought prudent that the Association, with its fluctuating and uncertain income, should augment its grant beyond the present amount. Upon this point I may remark, that the President and Council of the Royal Society have already evinced their sense of the value of the Observatory, by making a liberal grant to it for a special object; and that it is therefore not improbable that they may be willing to contribute *permanently* to its support. Its objects are at least as clearly allied to those of the Royal Society as to those of the British Association; and if it should be deemed that those objects have been in great measure attained, and that the establishment has proved itself deserving of permanent maintenance, it would seem expedient to place it on a more fixed basis than the present. I will only add, that believing, as I do, that the Observatory has already done much, and is capable of doing more, for the advancement of physical science, I should deplore the restriction of its efficiency, by insufficient pecuniary means, as a loss to science. Believe me, sincerely yours,
“To General Sabine, R.A., &c. H. LLOYD.”

The following is a Statement showing the expense of the last two years; an additional Assistant is now indispensable as a Photographer; and as the work of the Observatory increases, and its capabilities for the purposes of science become further developed, the probable future expenditure cannot be fairly estimated at less than 800l. per annum.

	1857. £. s. d.	1858. £. s. d.
Salaries	397 5 0	471 8 0
Apparatus	—	—
Materials, Tools, &c.	28 10 7	59 0 4
Ironmonger, &c.	66 9 4	19 13 5
Stationery, &c.	24 9 8	20 11 0
Coals and Gas.	19 0 2	47 10 8
House Expenses.	17 10 4	20 11 8
Porterage & Petty Expenses ..	5 19 3	6 12 4
Rent of Land	21 0 0	21 0 0
	£580 4 4	£76 13 5

The above is the actual expenditure, but the real annual increase in salaries is about 61l.; the difference in the above statement arises from the termination of the financial year being one month later than last year. In the detailed statement of receipts and expenditure, it will be observed that the amount received for verification of meteorological instruments has decreased, arising from the circumstance that the Meteorological department of the Government is now well provided with a store of instruments for its use.

As the financial position of the Observatory will probably be brought forward by the Council at the General Meeting of the Association at Leeds, the Committee suggest that the time has now arrived when strenuous efforts should be made to obtain such an amount of pecuniary aid as would ensure the permanent efficient working of this practical physical Observatory; for although the establishment is conducted with the strictest economy, the necessary work connected with the Observatory unavoidably creates a corresponding increase in the amount of the annual expenditure.

JOHN P. GASSIOT, Chairman.

Kew Observatory, Sept. 10, 1858.

Before proceeding to the Sectional business, we must also lay before our readers the—

Report of the Joint Committee of the Royal Society and the British Association, for procuring a Continuance of the Magnetical and Meteorological Observatories.

At the Meeting of the British Association, which was held at Dublin, in August, 1857, a resolution was adopted, proposing the continuance of the observatory at Kew, and observations, which was commenced under the auspices of the Royal Society, and of the British Association, in 1840; and a Committee, consisting of the President of the Association, the Rev. Dr. Robinson, and Major-General Sabine, was appointed, to request the co-operation of the President

and Council of the Royal Society in the endeavour to attain this object, and to take in conjunction with them such steps as may appear desirable for that end.

The Committee thus appointed accordingly held a meeting in London, on the 5th of November last, at which it was agreed to recommend that hourly observations, for not more than five years, should be undertaken at certain stations in the British Colonies; and a letter was addressed to the President of the Royal Society, asking for his co-operation, and that of the Council of the Society, in endeavouring to attain that object.

This application was favourably received by the Council of the Royal Society; and on the 10th of December 1857, the following resolution was adopted in reference to it:—

“That Sir John Herschel, the Astronomer Royal, the Dean of Ely, and Dr. Whewell, be appointed a Committee, to co-operate with the Committee appointed with this view by the British Association, and to take, in conjunction with them, such steps as may be necessary, including, if it be thought desirable, an application to Government.”

In consequence of this resolution, a correspondence took place among the members of the two Committees, which having resulted, it is believed, in a general agreement as to the course to be adopted, the Joint Committee so acting in co-operation met at Leeds on the 24th of September, and in the first instance proceeded to inquire into the nature and scientific value of the results which have already been secured by the system of observation hitherto carried out, at the observatories maintained by the Government, at the joint recommendation of these two bodies, with a view to forming a distinct opinion whether they are such as to merit being regarded as a reasonable, and, what may be called, a remunerative return for the labour and thought bestowed upon them, and the very considerable expenditure of the public money incurred by them. In so doing, they have limited their views to the results, as compared with the expenditure, in the British Colonial magnetic observatories only, without taking into consideration those deducible from observations made under foreign auspices; and they find that, at the cost of an expenditure which may be reckoned at about 400l. per annum, exclusive of the cost of instruments, outfit, and publication, the results of the several observatories at St. Helena, Toronto, Hobartson, and the Cape of Good Hope, during the respective continuance of each, the accumulated observations, so far as they have yet been discussed, have produced the following results, which they consider as satisfactorily established by the discussion:—

In the first place, the mean state of the several magnetic elements for each of the stations, as reduced to a fixed epoch, has been obtained with a precision of which nothing previously done has afforded any example—culminating in this respect the exactness of astronomical determinations, and competent to serve as a fixed point of departure, to the latest ages; and this for each of the elements in question—the dip, the declination, and the intensity of the magnetic force.

Secondly, that at each station the rate of regularly progressive secular change in all the three elements above mentioned has been ascertained with a degree of precision which contrasts strongly with the loose and inaccurate determinations of former times.

Thirdly, that the laws of the diurnal, annual, and other periodic fluctuations in the values of these elements, as exhibited at each station, have been established in a manner and with a decision to which nothing hitherto executed in any branch of science, astronomy excepted, is comparable; and that the results embodied in the examination of these laws have laid open a view of magnetic action so singular, and so utterly unexpected, as to amount to the creation of a new department of science, and the detection of a completely novel system of physical relations: for that, in the first place, the systems of diurnal and annual magnetic changes have each been separated into two perfectly distinct and physically independent systems,—the one, at any particular station, holding its course according to the time depending solely on the sun's hour angle at the moment of observation, and its meridian altitude at different seasons,—the other, comprehending all those movements which, under the name of magnetic storms, or “irregular disturbances,” have hitherto presented the perplexing aspect of phenomena purely casual, capricious in amount and in the particular occasions of their occurrence when regarded singly, has been shown, by these discussions, to be subject in its totality to laws equally definite with the others, though more dependent for their application on peculiarities of local situation. As regards the first of these systems of fluctuation, they find it demonstrated:—

That the sun's regular action on the magnetism of the globe is determined by a law of no small complexity and intricacy, but which, nevertheless, has been traced with precision and certainty, and shown to be subject to the first place, and for one of its arbitrary co-efficients, to the geographical situation of the place of observation with respect to a certain line or equator on the earth's surface, which cannot yet be precisely traced for want of sufficiently numerous stations but which seems to approach to the line of least intensity, and is very far from coinciding with the geographical equator,—and in the next, and for its other influential cause, to the fact of the sun's having north or south declination; so that the whole diurnal change in any one of the elements, and at any station, is made up of two portions, one of which retains the same sign and a constant co-efficient all the year round; the other changes sign, and varies in the value of its co-efficient with the annual movement of the sun from one side of the equator to the other.

That, consequently, for a station on the magnetic equator (or declination zero), the mean amount of diurnal change is not, when taken over the whole year, but that on any particular day in the year it has a determinate magnitude, which passes through an annual periodicity, with opposite characters in opposite seasons. And that for a station in middle latitudes the mean diurnal fluctuation is not nil,

but such as during every part of the year to exhibit an easterly deviation in the morning hours, and a westerly in the evening hours, for stations north of the magnetic equator, and *vice versa* for those south of it; but that the amount of this deviation, or the amplitude of the diurnal fluctuation, varies with the seasons, being exaggerated or partially counteracted by the alternate conspiring and opposing influence of the sun's declination during the summer and winter seasons.

As regards the irregular disturbances, though arbitrary and capricious in extent and in the moments when they may be expected, individually, this does not prevent their obeying with great fidelity the law of averages when grouped in masses, and treated separately from those of the former class. So handled they are found to conform in their average effect, at each of the twenty-four hours of the day, and on each day of the year, to the very same rules as regards the sun's daily and annual movement, with one remarkable point of difference, viz.—that their hours of maxima and minima are not identical with those of the regular class, but that each particular station has, in this respect, its own peculiar hours, analogous to what is called the "establishment" of a port in the theory of the tides. And that in consequence, the superposition of these two systems of diurnal fluctuation gives rise to a series of compound variations analogous to the superposition of two undulations having the same period but different amplitudes, and different epochal times. And that by attending to this principle many of the most complex phenomena, such as that of a double maximum and minimum, with the occurrence of a nightly as well as a daily movement are explained in a satisfactory manner.

The discussion of the observations already accumulated has further brought into view, and in the opinion of your Committee fully established, the existence of a very extraordinary periodicity in the extent of fluctuation of all the magnetic elements, and in the amplitude and frequency of their irregular movements especially, which connects them directly with the physical constitution of the sun, and with the periodical greater or less prevalence of spots on its surface—the maxima of the amount of fluctuation corresponding to the maxima of the spots, and these again with those of the exhibitions of the Aurora Borealis, which appears also to be subject to the same law of periodicity; a law which, as it does not agree with any of the otherwise known solar, lunar, or planetary periods, may be considered as, so to speak, personal to the sun itself. And thus we find ourselves landed in a system of cosmical relations, in which both the sun and the earth and probably the whole planetary system are implicated.

That the sun acts in influencing the earth's magnetism in some other manner than by its heat, seems to be rendered very probable by several features of this inquiry, and the idea of a direct magnetic influence exterior to the earth, is corroborated by the discovery of a minute fluctuation in the magnetic elements, having for its period not the solar but the lunar day, and therefore directly traceable to the action of the moon. The detection of this fluctuation by Mr. Krell, from a discussion of the Prague observations, has been confirmed by the evidence afforded by those of our Colonial observatories, and appears to be placed beyond all question by the recent deductions for the horizontal force and the declination extending over three years of observation at the Cape of Good Hope, which General Sabine has submitted for your Committee's inspection, and in both which the fluctuations in question emerge in a very satisfactory manner, and one calculated to give a high idea of the precision of which such determinations are susceptible, when it is considered that the total amplitude of oscillation due to this cause in the direction of the Cape-needle is only about 16° of angle.

Your Committee, looking at this long catalogue of distinct and positive conclusions already obtained, feel themselves fully borne out in considering that the operation in a scientific point of view has proved so far eminently remunerative and successful, and that its results have fully equalled in importance and value, as real accessories to our knowledge, any anticipations which could reasonably have been formed at the commencement of the inquiry.

Having satisfied themselves of the great and important value of the results already obtained, independent of the dormant interest as respects future discussion which the mass of observations accumulated continues to possess, and which it remains for future theoretical combinations to elicit,—your Committee next turned their attention to the question, whether and to what extent the maintenance of some or all of the old Colonial observatories, or the establishment of new ones for a limited term might be expected, first to give additional certainty and precision to the determinations already obtained,—and secondly, to elucidate points imperfectly made out, and more especially geographical relations which determine the greater or less amount of discordance between the epochal hours of the regular and irregular diurnal changes—relations which no doubt involve the causes of the irregular fluctuations themselves—causes at present involved in the greatest obscurity,—and to obtain indications of the points in the earth's surface, at which the forces producing them originate.

As regards the general question as to the desirableness of some continuation of the observations, it seems hardly to be referred to our consideration as a Committee—the resolutions came to both by the British Association and by the Council of the Royal Society, in the appointment of their respective Committees of co-operation, indicating an opinion already conclusively formed on the part of both bodies to that effect. They have felt it due to themselves, however, to come to an independent conclusion on that point, and having done so with perfect unanimity, on the grounds already adduced, and the expectations for the future which those grounds justify, they next address themselves to the consideration of the two points above indicated, and to the important questions—first, whether to recommend the continuance or resumption of the establishments at the former stations, or the selection of new ones;

and secondly, with how few new or revived establishments, with how limited a scale as to extent and expense, and with how short a period as to the minimum term of their duration, the expectation of these advantages being secured could be compatible, and finally to fix upon the stations most desirable.

As regards the first point referred to, viz.—the more complete establishment of the laws themselves, and the giving of greater numerical precision to their expression; the Committee is of opinion that the laws themselves are not likely to be subverted or contradicted by a larger series of observations at any station for which they have once been shown to prevail; but that every new station differing much in geographical situation from the former, in which they might be found verified, with or without supplementary modifications, would undoubtedly add strength to the induction by which they have been concluded. Additional numerical precision, on the other hand, would only be attained by a continuance of observations at former stations, and is not a point of sufficient importance in their opinion to be entailed to any weight in opposition to considerations in favour of change,—while in the one important case in which the irregular disturbances are especially desirable—that of the solar period, such additional precision will be acquired ultimately as a matter of course by continued observation at any one of the existing permanent observatories, of whose business magnetic observation forms a part, as well as by any amount of Colonial establishments.

It is therefore mainly in the elucidation of obscure and difficult physical points, and in the probable extension of our knowledge of the geographical and other conditions on which the irregular disturbances depend, that our hope of advantage from further observations consists; our conviction being that, without special observations at well-selected stations—selected, that is, with a view to these objects—there is little or no prospect of further progress. The general character of the magnetic phenomena may be considered as secured from loss; but the great problem remains unresolved,—the local influences are yet to trace, and the only means of tracing them must consist in varying the position of our stations, so as to embrace great differences in geographical situation, and in conformity with such indications as can be gathered from our present experience. The magnetic establishments permanently existing in Europe and America are confessedly inadequate to afford the requisite information. The stations which have occurred to your Committee, as most eligible, would be, Vancouver Island, Newfoundland, the Falkland Isles, Bermuda, Ceylon, Shanghai or some locality in China, and Mauritius, but they are fully aware that to demand from the national purse the institution of observations at all these points would be more than is warranted by any pressing necessity, and ought therefore not to be insisted on. Among them, the principal point of interest for reasons which will be presently mentioned, are Vancouver Island, Newfoundland, the Falkland Isles, and Pekin or some near adjacent Chinese station, and the Committee consider that much valuable information must accrue from observations sufficiently prolonged at these, to which, therefore, they would be understood to limit their recommendation. In regard to the length of time over which they would desire to see the observations extended they consider five years being about half the solar period, and as being also sufficient to give a fair grasp of the secular change of the magnetic elements as a period both in consonance with that which has been ascertained on former occasions, and in some sort designated by the nature of the case.

The reasons which induce them to give a preference to these over the rest of the stations enumerated are as follows:—Between Toronto and Point Barrow the difference of the epochal hours of the irregular diurnal fluctuations is such as to amount to a complete opposition of phases, a circumstance which goes far to point out the latter station as being in the immediate neighbourhood of the origin of those irregular disturbances. Should observations be established at the two stations so proposed, there is every reason to hope, as will appear from a document drawn up at the request of the Committee by General Sabine, and with his permission appended to this Report, that the observations at Toronto, which have been partially re-established since 1855, would, with a view to co-operation for this especial purpose, be wholly resumed on a fitting application to the Colonial Legislature. And, in addition to this, should an application be made to the Norwegian Government for the establishment, during the same period, of an observatory at the North Cape prove successful, (which there is every reason to hope, such an application made on a former occasion having been well received, and having ultimately failed owing only to a want of attention to some point of diplomatic form in its mode of communication), we should then have a chain of stations in high northern latitudes, the results obtained at which being severally brought into comparison with those already procured at Point Barrow, and with each other, could hardly fail of bringing out some very positive conclusion.

As regards the proposal for a station at the Falkland Isles, it is presumed, from the general course of the magnetic line of minimum intensity, that this station will prove, in analogy to the Cape of Good Hope, and in contrast with the northern stations recommended, to have the character of an equatorial, or approximate equatorial, station. And in respect to that proposed in China, that it will completely carry round the globe the chain of northern middle latitude stations,—the intermediate links being supplied by the Russian observatories, and by those which it is hoped may be established at the North Cape and at Toronto. As regards the Falkland Isles and Newfoundland, it should be noticed that there exist considerable facilities and conveniences for the comfortable establishment of an observatory there; and in respect of the other two it may be remarked, that they are both points of great present interest, and that a determination of the meteorological as well as

magnetic peculiarities of both would be important. The affections of a telegraphic wire by electric discharges in the nature of Aurora Borealis have already attracted attention, and produced confusion in the ordinary use of such wires, and constitute one of the motives for inquiry into the nature and laws of the so-called magnetic storms. It may also be observed that, in reference to the anomalous equation of the sun's magnetic intensity, or the effect of its annual approach and recess due to the ellipticity of the earth's orbit, the influence of local temperature upon the observations requires to be eliminated, in order to bring this effect into evidence, by a combination of the results obtained at stations whose seasons are opposite.

In reference to the important consideration of keeping down as much as possible the outlay consequent on the establishment of these observatories, your Committee have given attention to the question whether it be desirable to continue, as heretofore, the printing of the observations *in extenso*—a measure resulting in the production of vast and costly volumes, and entailing a great amount of laborious superintendence. They consider that the form of the observations remaining unaltered, and the principles of their reduction being now rendered familiar, this would not be necessary, provided the original observations were registered in triplicate, and the copies separately deposited in different and secure custody for preservation and occasional reference when required, and provided that sufficient and well-digested abstracts of their reduced results were published. One series of observations, however, they consider must be excepted from this alteration of system,—those of a continuous nature, made on term days, four of which per annum they desire to see still kept up,—and those taken on occasions of magnetic storms, when continuous observation is substituted for that on the regular hourly intervals; for the treatment of such observations is still a matter of scientific enquiry, and to render them available, in comparison with others, the complete register is indispensable.

Your Committee cannot but contemplate a revival of active interest, and co-operative participation in the system of observation on the part of our Colonial and of Foreign Governments, when once it shall become known that the subject is resumed by our own Home Government in the manner recommended. On this subject they beg to refer to General Sabine's reply to their inquiries, already alluded to, which places in a distinct point of view the expectations which may justly be indulged on that score. In reference, moreover, to the personal and material establishment at each of the Government observatories, this document contains a summary of what is needed, and of what ought to be applied for.

And this leads your Committee to a point which they consider of such importance to the success of the whole proceeding, that they cannot help embodying their opinion on it in this Report. It is of little avail to accumulate observations unless their effective and complete reduction be provided for, and the assurance obtained that when reduced they will undergo such discussion and scientific treatment as shall elicit from them the laws of the phenomena of which they are the records. The zeal and ability with which the present Superintendent of the Government Magnetic and Meteorological Observatories has hitherto executed this task, if extended to the new series now called for, would afford that assurance in its fullest extent; and they earnestly trust that this will not be lost sight of in the arrangements to be made in carrying out their proposals, if adopted.

There is another point to which your Committee consider their attention ought to be paid simultaneously with the establishment of the proposed observatories—it is that of the extension of Magnetic Surveys of the districts in their immediate neighbourhood, with a view to fixing the situation and direction of the iso-magnetic curves within some considerable adjoining area in the case of the Falkland Isles—that of the whole group.

On this point the following remarks by General Sabine, in a communication addressed by him to us in reply to certain inquiries which we considered it right to make of him, are, in the opinion of your Committee, conclusive in deciding them to recommend that provision be also made for the execution of such surveys, collaterally with the observations at the fixed stations:—

"Recent observations in North America, discussed in the Proceedings of the Royal Society for January the 7th, 1858, have made known that the general movement of translation of the isoclinical and isogonic lines, which from the earliest observations have been proceeding from west to east, has within a few years reached its extreme eastern oscillation, and that the movement in the reverse direction has already commenced; we live therefore at an epoch in the history of terrestrial magnetism, which we have reason to believe will be regarded hereafter—when theory shall have more advanced—as a highly important and critical epoch. The geographical position of the maximum force of the northern hemisphere appears to have reached its extreme easterly elongation, and from this time forth may be expected to move for many years to come towards the meridian which it occupied in Halley's time, accompanied by a corresponding change in the positions and forms of the isodynamic, isoclinical, and isogonic lines in North America: a careful determination of the absolute values and present secular change of the three elements at this critical theoretical epoch, at stations situated on either side of the American continent, and nearly in the geographical latitude of the maximum of the force, would furnish therefore data for posterity, of the value of which we may have a very inadequate appreciation at present. I may refer to the discussion prefixed to the third volume of the Toronto Observations, to show that the means and methods with which we are conversant are adequate for the purpose, and I may indicate Vancouver Island and Newfoundland as colonies well suited for establishments of the same nature as those of which the efficiency has been proved."

As regards the instrumental means to be employed, the Committee believe that the consideration of the subject

would be more fitly undertaken by the Royal Society, who will probably think it right to appoint a special committee, as was done on the former occasion, to consider it maturely, and to report upon it. Well as in general the instruments employed in the British colonial observatories have performed, it may be desirable to consider whether they could not be improved, by diminishing considerably the size of the magnetic bars employed. Small bars indicate more certainly the rapid magnetic changes; they may be hardened more perfectly, and therefore vary less in their magnetic condition with changes of temperature; they admit of more perfect protection from the effects of disturbing aerial currents; and finally, the instruments may be constructed at less expense, and may be grouped together in a smaller and less costly building.

The Joint Committee therefore have finally agreed to the following Resolutions, which they submit for approval to their respective appointing bodies:—

1. That it is highly desirable that a series of magnetical and meteorological observations, on the same plan as those which have been already carried on in the colonial observatories for that purpose, under the direction of Her Majesty's Board of Ordnance, be obtained, to extend over a period of not more than five years, at the following stations:—1. Vancouver Island; 2. Newfoundland; 3. The Falkland Isles; 4. Pekin, or some near adjacent station.

2. That an application be made to Her Majesty's Government, to obtain the establishment of observatories at these stations for the above-mentioned term, on a personal and material footing, and under the same superintendence, as in the observatories now discontinued, at Toronto, St. Helena, and Van Diemen's Island.

3. That the observations at the observatories now recommended should be comparable with and in continuation of those made at the last-named observatories, including four days of term observations annually.

4. That provision be also requested at the hands of Her Majesty's Government, for the execution, within the period embraced by the observations of magnetic surveys in the districts immediately adjacent to those stations, viz.,—of the whole of Vancouver Island and the shores of the strait separating it from the main land,—of the Falkland Isles,—and of the immediate neighbourhood of the Chinese observatory if practicable, wherever situated,—on the plan of the surveys already executed in the British possessions in North America, and in the Indian Archipelago.

5. That a sum of 350*l.* per annum, during the continuance of the observations, be recommended to be placed by Government at the disposal of the general Superintendent, for the purpose of procuring a special and scientific verification and exact correspondence of the magnetical and meteorological instruments, both of those which shall be furnished to the several observatories, and of those which, during the continuance of the observations for the period in question, shall be brought into comparison with them, either at Foreign or Colonial stations.

6. That the printing of the observations *in extenso* be discontinued, but that provision be made for their printing in abstract, with discussion, but that the term observations, and those to be made on the occurrence of magnetic storms, be still printed *in extenso*; and that the registry of the observations be made in triplicate, one copy to be preserved in the office of the general Superintendent, one to be presented to the Royal Society, and one to the Royal Observatory at Greenwich, for conservation and future reference.

7. That measures be adopted for taking advantage of whatever disposition may exist on the part of our Colonial Governments, to establish observatories of the same kind, or otherwise to co-operate with the proposed system of observation.

8. That in placing these Resolutions and the Report of the Committee before the President and Council of the Royal Society, the continued co-operation of that Society be requested in whatever ulterior measures may be requisite.

9. That the President of the British Association be requested to act in conjunction with the President of the Royal Society, and with the members of the two Committees, in any steps which may appear necessary for the accomplishment of the objects above stated.

10. That an early communication be made of this procedure to His Royal Highness the Prince Consort, the President elect of the British Association for the ensuing year.

We add—

The General Treasurer's Account,

From August 26, 1857, commencement of Dublin Meeting, to September 22, 1858, at Leeds.

RECEIPTS.		£.	s.	d.
To Balance brought on from last Account	..	123	17	10
Composition for future publications	..	5	0	0
Life Compositions at Dublin and since	..	180	0	0
Annual Subscriptions ditto	..	489	0	0
Associates' Tickets ditto	..	960	0	0
Ladies' Tickets ditto	..	569	0	0
Twelve Months' Dividends on 6,200 <i>l.</i> , 3 per cent. Consols.	..	181	7	0
Sale of 700 <i>l.</i> , 3 per cent. Consols.	..	622	17	0
From Sale of Publications—viz. for Reports of Meetings, 111 <i>l.</i> 13 <i>s.</i> 8 <i>d.</i> ; Catalogues of Stars, Dove's Lines, 66 <i>l.</i> 15 <i>s.</i> 3 <i>d.</i>	..	178	8	11
		£3,289	10	0

PAYMENTS.		£.	s.	d.
By paid expenses of Dublin Meeting, sundry Printing, Binding, Advertising, and incidental Payments by the General Treasurer and Local Treasurers	..	376	5	7
Printing Report of the 20th Meeting, Engraving, &c.	..	657	3	9
Salaries Twelve Months	..	350	0	0
Purchase of 1,200 <i>l.</i> , 3 per cent. Consols	..	1,048	10	0

Maintaining the Establishment of Kew Observatory	500	0	0
Earthquake Waves Experiments	25	0	0
Dredging on the West Coast of Scotland	10	0	0
Vitality of Seeds Experiments	5	5	0
Report on the British Annelida	25	0	0
Experiments on the Production of Heat by Motion on Fluids	20	0	0
Dredging near Belfast	18	13	2
Vegetable Imports of Scotland	10	0	0
Balance at the Banker's	£219	4	3
Ditto due from the General Treasurer and Local Treasurers	24	9	0
	243	13	3
	£3,289	10	9

THURSDAY.

SECTION A.—MATHEMATICAL AND PHYSICAL SCIENCE.

President—Rev. Dr. WHEWELL.
Vice-Presidents—Prof. AIRY, Rev. A. BARRY, Sir D. BREWSTER, Rev. Dr. LLOYD, Rev. Prof. WALKER, Lord WHOTTONLEY.
Secretaries—Rev. N. KARNISHAW, H. J. S. SMITH, Prof. STEVENS, Prof. FENNER, J. P. HENNESSY.
Committee—Prof. ADAMS, W. ADAM, Rev. J. BARLOW, Rev. J. BOOTH, C. BROOKE, A. CAYLEY, Rev. Prof. CHEVALLIER, E. J. COOPER, Prof. FARADAY, L. FLETCHER, J. F. GOSSET, Dr. GREENE, J. GLAISHER, Sir J. P. W. HERSHEL, Prof. HENNESSY, W. HOPKINS, W. HUGGINS, J. P. JOULE, W. LASSELL, Dr. LEE, Prof. PHILLIPS, Rev. Prof. PRICE, Prof. RANKINE, Rev. Dr. R. REYNOLDS, General SABINE, Prof. STOKES, Rev. Padre SECHI (Rome), Col. SYKES, J. WALSH, Prof. WHEATSTONE, T. WEBSTER.

THE PRESIDENT (Dr. Whewell), on taking the chair, addressed the Section:—The managers of the Association have assigned a small room to this Section. I hope that no one is at present inconvenienced by this. I shall be glad if it should be found that in this respect the managers have been mistaken. But the fact is, that we are very much in the habit in this Section of treating our subjects in so sublime a manner that we thin the room very decidedly. This is true, but this is no fault of ours. We seek the laws of Nature, and Nature presents to us her laws in a form which is to many persons repulsive,—namely, a *mathematical* form. It has been truly said, both by sacred and profane writers, that all things are made by number, weight, and measure. Now things which happen by number, weight, and measure happen according to mathematical laws, according to the relations of number and space. According to such relations the laws of various of the appearances which Nature presents to us were studied at the earliest periods of the intellectual progress of man; and if the laws detected by man on such subjects are in some respects perplexing to many from their mathematical form and complexity, and are thus repulsive, they are at least attractive in another point of view,—for the extent and brilliancy of the success which has been obtained in these fields of speculation are such as could not have been in any degree anticipated at an early period. And the truths obtained in this way at an early period of man's intellectual progress are even still of great value and interest, and are essential parts of the body of scientific truth at the present time. The astronomy of the ancient Greeks, expressed in the mathematical forms which they devised, has been an important element in the formation of that astronomy of modern times of which I have several of the eminent masters near me. And this connected progress of knowledge from ancient to modern times has been exemplified in various portions of science, and still goes on appearing in new examples. You recollect, perhaps, that a Roman philosopher, Seneca, made a remark which, though conjectural, is striking. In speaking of comets, he said, these objects now appear to follow no law, as the planets do. They appear unforeseen and unexpected, filling us with perplexity and alarm. Yet these bodies, too, he said, shall disclose their laws to astronomers in future years. Their returns will be predicted, their laws known, and our posterity will wonder that we did not discern what is so plain. And this prophecy has been fulfilled. Comets have had their returns predicted, and have fulfilled their predictions. And though this is not always the case, for comets still shine forth unpredicted and unforeseen, yet still, even in such cases, we are not quite destitute of knowledge of their laws and progress,—for when an unexpected stranger of this class blazes forth in our sky, as soon as he has shown himself for a few days, we can mark the path which he will follow, the rate at which he will travel, and in a great degree the appearances which he will assume. And even objects

which as yet are more lawless and perplexing to our science than comets are, are still not altogether extraneous to the domain of our knowledge. There is a class of such objects which has been especially attended to by the British Association. This is the subject of the first of the communications which are to be laid before this Section to-day. I speak of Prof. Powell's 'Report on Luminous Meteors.' These objects, falling stars, shooting stars, fiery globes, or whatever they may be commonly called, have attracted the attention of this Association for many years; and the Report which we are to have laid before us to-day is the continuation of several Reports of the same kind prepared by the same gentleman in preceding years. These bodies, as I have said, are in a great degree irreducible to laws and extraneous to our science; yet not wholly so. We have speculations of ancient times by some of our most eminent philosophers, in which these bodies play an important part. Prof. W. Thomson has been led, by his mathematical speculations on Heat, to the conclusion, that the heat of the sun is maintained by the perpetual falling in upon his surface of the abnormal bodies moving in the solar system, which appear to us as luminous meteors and shooting stars. And he conceives that he has shown that there is in those bodies an abundant supply to keep up the heat of the sun; and that, by the effects of them, the sun may have gone on radiating heat for thousands and thousands of years without the smallest diminution. And this, again, is the result of profound and complex mathematical calculations,—so wide is the domain of mathematical reasoning, and so necessary is it in any line of speculation in which we are to convert our ignorance into knowledge. I may mention, as a public example of this, a case which is far removed from the vastness of astronomical phenomena,—a case of the manipulation of mathematical law upon a scale of the smallest dimensions, and in the work of a humble insect. I speak of the form of the cells of bees: a mathematical problem which already attracted the attention of the ancient Greeks, and which has been the subject of mathematical investigation by several of the most eminent mathematicians of modern times,—the most eminent, for being a problem involving the properties of space of these dimensions, it requires admirable powers of mathematical conception. Upon this subject two communications are promised to the present Meeting, to be laid either before this Section or the Section of Natural History. And in order further to exemplify the advantages derived from the action of the British Association, I may mention another report upon a very different subject, Mr. Cayley's 'Report on the Progress of Theoretical Dynamics.' The generality, multiplicity, and complexity of the recent labours of analysts in this department of mathematics have been so great that ordinary mathematicians cannot hope to follow them by reading the original memoirs; and I am greatly obliged, as one of them, to Mr. Cayley for enabling us compendiously and easily to understand what has been done and how it has been done. Perhaps, after all, his report is not so very unlike that of Prof. Powell 'On Luminous Meteors,'—for the original researches of the great analysts who have treated this subject, though bright and objects of wonder, are so far above our head and so difficult to understand, that they are not unlike the things tabulated in the other report. And now, having explained that we must often be necessarily difficult to follow in this Section, I must ask the ladies and gentlemen here present, as the *Spectator* has his readers, to believe that, if at any time we are very dull, we have a design in it.

'Continuation of Report on Luminous Meteors for 1857-58,' by the Rev. Prof. POWELL.—During the past year the communications which I have received on behalf of the British Association of observations of luminous meteors have been comparatively few. I have, however, found that if some observers of former years have discontinued their labours, or have been unsuccessful in the discovery of meteors, others have come into the field. And, on the present occasion, besides several former contributors, I have to thank Dr. Gladstone and Mr. J. G. Symons for some valuable sets of

observations. Of the periodical meteors few accounts have come to my knowledge. Very few were seen in November last; but in the present year many were observed on the 8th, 9th, and 13th of August,—the 10th having been in many places cloudy. In the last report some speculations were mentioned, referring to the apparent magnitude of the luminous discs of meteors, and the experiments of Prof. Lawrence Smith, U.S., tending to show that spurious discs are formed by intensely bright bodies, of an apparent size immensely exceeding the real dimensions of the solid matter. This subject has been considered at large in connexion with the whole theory of meteoric bodies in a very recent work, 'Popular Physical Astronomy,' by Mr. Daniel Vaughan, of Cincinnati, U.S. (1858). The main point of the author's theory consists in supposing that the universally diffused ethereal medium must be condensed on the surfaces of all comical masses; intensely so on the surface of the sun, thus giving rise to its light and heat; and in proportionate degrees on lesser bodies, such as meteorites. By their rapid motion, more especially when they graze or enter our atmosphere, it is excited to violent chemical action, giving rise to the development of light and heat. Their velocity on entering the atmosphere, and the consequent compression and resistance they encounter are the cause of their being crushed into fragments; and thus appearing to explode before they fall to the earth. The author objects to the theory of Prof. Lawrence Smith, and contends (from experimental illustration) that the apparent enlargement of discs arises simply from the reflective power of the surrounding air, and will, therefore, not apply to meteors out of our atmosphere. He also combats the theory of Prof. W. Thomson as to the source of the solar light and heat from the impact of meteoric bodies. Some details of this theory are given in the appendix. The chief defect in it seems to be, to account for the nature and mode of excitement of the chemical action supposed; and again to explain why on this hypothesis the earth and the planets are not also luminous.

Prof. STEVELLY, who read the Report, stated that it was accompanied by tabulated notices of the meteors which were observed by G. J. Symons, M.B.M.S., during the years 1855-56, and to September, 1857, also from January to September, 1858, with those observed by Dr. Gladstone from July 20th to August 13th, 1858, with occasional notes of the more remarkable meteors. Mr. Symons's list for 1858 was also accompanied by a very remarkable table, by double entry, showing at a glance the number of meteors which were seen to pass from one constellation to another; these of course would be printed in full in the next volume of Reports. Prof. Stevelly then went on to say, that he had not had time before the Meeting to write to Prof. Powell an interesting notice of a meteor he and some others had seen in the year 1840. The paper on which he had taken a note of it had been laid aside, but when changing his house lately had again turned up, and he would now read it to the Section, as it enabled him to calculate approximately the height of the meteor above the earth. "On Wednesday evening, the 7th of October, 1840, as a number of us were returning from a Lecture on Storms, delivered by Mr. Espy in the rooms of the Natural History and Philosophical Society of Belfast, as we were passing along the east side of College Square, a beautiful meteor appeared for a few seconds, almost due south of us, but a little to the west, and so bright that you could distinctly read by its light. It was then within about 20 minutes to ten o'clock; the moon was shining, though at the moment obscured by a cloud; and afterwards, when I found that others had seen the same meteor at a distance, we estimated, as accurately as we could the altitude at which it had been seen, and found it at about 30°. On the night of Friday, the 9th, or two days after, I travelled to Dundalk by the Dublin mail-coach, and the guard, Joseph Hill, asked me, had I seen the very brilliant flash of light on Wednesday evening, at about a quarter to ten o'clock. I told him I had, and inquired from him the particulars of where and how he saw it. He informed me of the place, which was about 5½ miles out of Dublin, where the

road was very straight, and tending to the north. He had seen it, as he explained, almost overhead, but somewhat to his right hand, and it was so bright for some seconds that the entire place around was lighted up so that a person could distinctly read by it. It had, therefore, been vertically over a place about 75 Irish miles from Belfast, and from these data it is easy to calculate its altitude above the earth, which must have been about 43 miles. A few days afterwards, the same guard, Joseph Hill, sent me the following letter, and extract from the *Warder* Dublin newspaper of Saturday, the 10th, which confirms Hill's accuracy, as the Correspondent of the *Warder* must have seen it on the opposite side of the place where it had been vertical from what we did.—

Belfast, 12th October, 1840.
Sir,—I had the pleasure also of seeing this phenomenon the same time as Correspondent. I was about 5½ miles in this side of Dublin when it happened.—Yours, &c.
JOSEPH HILL, Mail Guard.

'Extraordinary Appearance in the Sky.—(From a Correspondent.)—About a quarter before ten o'clock on Wednesday, at an immense altitude, a white ball of fire appeared in the north-eastern part of the sky for a moment, and shot downwards, illuminating the whole heavens, and causing an extraordinary sensation in those who witnessed it before its descent. The ball was tinged with a beautiful violet blue.—From the *Warder* of Saturday, October 10, 1840."

—The ASTRONOMER ROYAL observed, that it was worthy of attention that nearly all the meteors whose altitude above the earth has been determined, as well as this remarkable one now brought under the notice of the Section by Prof. Stevelly, had been at an altitude of about 40 miles above the earth. He also thought the table given by Mr. Symons worthy of especial attention, in which, by a method like that by which we tabulate the distances of many towns from one another, Mr. Symons had contrived to place very clearly before the mind the directions of the apparent motions of several meteors and their numbers moving in each direction. This table he considered a valuable suggestion, and worthy of imitation.—Prof. CHEVALLIER reminded Prof. Stevelly that about the same time as the appearance of the meteor which he had now drawn attention to, another had been observed by them—one at Belfast and the other at Durham, from which its height had, as well as he recollected, turned out upwards of 50 miles.—Prof. STEVELLY said it was a remarkable auroral arch, which had been simultaneously observed by Prof. Chevallier at Durham, by Prof. Phillips at York, and by himself at Belfast, as it very slowly moved on towards the south and east; and its altitude had been found by Prof. Chevallier, from a comparison of these observations, about 64 miles.—Prof. CHEVALLIER assented to this statement.

'An Account of some Experiments on Radiant Heat, involving an Extension of Prévost's Theory of Exchanges,' by Mr. B. STEWART.—These experiments were performed with the aid of the thermomultiplier, the source of heat being for the most part bodies heated to 212°. Four groups of experiments were considered. Group the first contains those experiments in which the quantities of heat radiated from polished plates of different substances at a given temperature, are compared with the quantity radiated from a similar surface of lampblack at the same temperature. The result of this group of experiments is, that glass, alum, and selenite radiate about 98 per cent. of what lampblack does—thick mica, 92—thin mica, 81—and rock salt only 15 per cent. The second group of experiments was designed to compare together the quantities of heat radiated at the same temperature from polished plates of the same substance, but of different thicknesses. The result of this group was, that while the difference between the radiating power of thick and thin glass is so small as not to be capable of being directly observed, there is a perceptible difference between the radiation from thick and thin mica, and a still more marked difference between the radiation from plates of rock salt of unequal thickness. The third group of experiments was made with the view of comparing the radiations from various polished plates with that from lampblack, as regards the quality of the heat,—its quality being tested by its capability of transmission through a screen of the same material as the radiating plate. From this group

of experiments it appears that heat emitted by glass, mica, or rock salt is less transmissible through a screen of the same material as the heated plate than heat from lampblack,—this difference being very marked in the case of rock salt, which only transmits about one-third of the rays from heated rock salt. The common opinion that rock salt is equally diathermanous for all descriptions of heat is therefore untenable. The fourth group of experiments shows that heat from thick plates of glass, mica, or rock salt is more easily transmitted by screens of the same nature as the heated plate than heat from thin plates of these materials. It was shown that all these experiments may be explained by Prévost's theory of exchanges, somewhat extended. This extension consists of the following laws:—1. Each particle of a substance has an independent radiation of its own equal in all directions and without regard to the distance of the particle from the surface of the body. 2. The radiation of a particle equals its absorption, and that for every description of heat. 3. The flow of heat from within upon the interior surface of a polished plate of indefinite thickness is proportional to the index of refraction of the body, and that for every description of heat. The bearing of these experiments on Dulong and Petit's law of radiation was then attempted to be traced. It was shown that unless bodies from simply being heated change their transmissibility for the same description of heat (which there is no reason to suppose), the radiation of thin plates or particles at a high temperature will bear a less proportion to the total radiation of that temperature than at a low,—the consequence will be, that the radiation of single particles will increase with the temperature in a less degree than Dulong and Petit's law would indicate. It may even be that the radiation of a particle or very thin plate may be proportional to the absolute temperature of that particle. Taking a piece of glass or mica, therefore, at a low temperature, as it is very opaque with regard to the heat radiated by itself, we may suppose that the total radiation consists of that of the outer layer of particles only, that from the inner layers being all stopped by the outer. At high temperatures, however, we may suppose that there is not only the radiation of the outer layer, but also part of that of the inner layer which has been able to pass, swelling up the total radiation to what it appears in Dulong and Petit's experiments. This way of looking at radiation may possibly bring the radiative power of particles to obey the same laws with the conducting power of particles, which Prof. Forbes has shown decreases with an increase of temperature. The author of this communication is indebted to Prof. Forbes for the use of the instruments and substances employed, and also for many valuable suggestions with regard to the experiments it contains.

'A Communication on Heat and on the Indestructibility of Elementary Bodies, by Miss ROSINA ZORNIN,' by Mr. W. S. AYTON.

'On the Distribution of Heat in the Interior of the Earth,' by Dr. F. A. SILJESTRÖM, of Stockholm.

Prof. HENSESSY remarked that the views of Dr. Siljeström seemed to state in other words the well-known fact, that a mass of fluid possessing different temperatures in different parts of its interior must be subjected to a process of convection. The result is usually a change of volume in the entire mass of circulating fluid. This change is capable of being observed in ordinary experiments, and may also affect the volume of the fluid matter in the interior of the earth, provided the changes of temperature of the fluid are sufficiently great. But it is clearly proved that the refrigeration of the earth is now so extremely slow, that it is not likely that any considerable changes of volumes arising from this cause could have arisen within recent periods. If such changes have arisen, they must have occurred during remote geological epochs.

'Note on Observations of Temperature,' by Dr. SILJESTRÖM.

'On the Constitution of Comets,' by Dr. SILJESTRÖM.

When this paper had been read, a gentleman in the Section begged to know whether the astronomers had determined the size of the smallest

body which would be visible at the distance of one of these comets. For his part he was dissatisfied with all the statements of their nature which had been published. When it was considered that the velocity of the comet now visible when passing its perihelion would be more than a million of miles an hour, he could not believe such a velocity could belong to any material solid body.—The ASTRONOMER ROYAL reminded the gentleman who had last spoken, through the President of the Section, that the very velocity of the comet which seemed so enormous to him was deduced from the hypothesis that it was a material solid body, and that therefore no argument could be a sound one which opposed its materiality from its extremely swift velocity.

'On the Conditions of Equilibrium in a Rotating Spheroid,' by Dr. SILJESTRÖM.

'On the Magnetic Dip at Stockholm,' by Dr. SILJESTRÖM.

There were two other communications on the list of papers for the day; but when called on, the authors were not in attendance. While waiting, Lord WROTTESELEY, who had taken the chair during the temporary absence of the President, read to the Section 'Extracts from Letters received by E. J. Cooper, M.P. from Mr. A. Graham, M.R.I.A.'

"Donati's Comet.

"Markree Observatory, Sept. 20.

"I hoped to be able to give you ere now some interesting details of this glorious comet, but I was arrested in my calculations by a curious result in my observation of September 14,—the only really good one which the weather permitted me to make up to that time. Both the compared stars occur in Bessel's zone, 359. One of the two is also in Lalande, No. 21775 (Catalogue). The mean right ascensions from the two catalogues differ by 12 seconds in time! There were two wires taken by both observers, and I have carefully looked over the reductions. I even got C. Robertson (second assistant) to ascertain the mean places, and he brought out exactly the same result as I. On Saturday evening (18th) the comet presented rather a striking appearance in the nucleus and coma. The part to the right-hand side of the tail was brighter than the left. I directed the attention of C. Robertson to this circumstance, to make sure that my eyes did not deceive me, and his impression precisely accorded with mine. Now it did not strike me at the time that this was the side next the sun, and that the phenomenon indicated a phase such as would be caused by light reflected from the surface. The appearance of the tail was exactly such as would be presented by a hollow conoid of thin vapour under the circumstances. It will be interesting if other observers confirm this remark."—September 22. "We got satisfactory observations of the comet on Monday and Tuesday nights. The note in the observing book for Monday the 20th is as follows: The south side of the nucleus faded off gradually into the coma without any defined boundary line. The north and north-east pretty well defined. The nucleus seemed to be stretched out westward at an angle of about 120° with the tail, giving a rough idea of a cusp. There was a similar appearance towards the east, in continuation of the line, but not so well marked. Southward of a line touching the nucleus on the north side, and making an angle of about 60° with the axis of the tail on the east side, the light was decidedly stronger than on the other side of this line. The entire impressed us with some such idea as a view of Venus would give when slightly gibbous, and when seen very near the horizon, with bad definition. The light of the tail was pretty uniform throughout the entire breadth for about twice the diameter of the nucleus northward. Thence it parted into two rays, the upper one being the brighter and broader. The tail was directed precisely to χ Urse Majoris, and was about 6° long at least, but the strong moonlight probably obliterated the fainter portion.—Note taken Sept. 21. Appearance pretty much as last night. The angle made by the line, which I have regarded as the north limit of the phase, with the axis of the tail, is not quite so small as 60°. About 75° is a more correct estimate. The tail was directed almost precisely to Polaris. Moonlight greatly diminished

the effect, and took from the apparent length of the tail."

SECTION B.—CHEMICAL SCIENCE.

President—Sir J. F. W. HERSCHTEL.
Vice-Presidents—Rev. W. VERNON HARCOURT, Prof. FARADAY, J. P. GASSIOT, Dr. ANDREWS.
Secretaries—Dr. GLADSTONE, W. OLLING, R. REYNOLDS.
Committee—Rev. J. Barlow, Dr. Edwards, W. HUGGON, Dr. Jones, Dr. Macadam, J. Mercer, G. Morley, T. Scattergood, E. Schunck, Dr. Smith, W. S. Ward, R. Warrington, J. Waterhouse, Dr. Matthiessen, H. Deane, G. Foster, P. J. Worsley, Dr. Russell, F. C. Calvert, J. Smith, Jun., G. Gladstone, Prof. Wheatstone, A. Gages, J. P. Joule, Dr. Living, F. Jennings, C. H. B. Hamby, J. Young, A. Galletly, Dr. Gilbert, Dr. Fugh, T. J. Pearsall.

Sir J. F. W. HERSCHTEL, Bart., on taking the chair of the Section, said, though it is with much satisfaction that I find myself placed in the Chair of this Section, it is a feeling not untempered with serious misgivings. On none of the occasions when I have attended the Meetings of the British Association, has it ever been in my power to be present at any Session of the Chemical Section, and, attached as I have always been to that branch of science, and contemplating with the most lively sympathy the labours of its more active members, this has been to me a source of great regret and disappointment. And now when the opportunity I have always so earnestly desired is accorded me in its fullest extent, it comes accompanied with the painful feeling of occupying a position, which probably not one of the distinguished cultivators of the science whom I see around me, would not be more competent to fill with credit to himself, and satisfaction to the Section. However, in this respect, I must throw myself on your indulgence. If there be any conventional usages, in the conduct of the business of the Section, which have grown up as matters of habitual arrangement, and been ascertained by experience to facilitate its working, with which I am unacquainted, there are those around me who will good-naturally set me right. But there is one deficiency which I feel very much. It is the want of that thorough acquaintance—that sort of *coup d'œil* extending over the whole area of the vast field of chemical, mineralogical, and agricultural research which the objects of this Section embrace, which would justify me in the ambitious hope that I could command your attention as I am aware that my predecessors in this Chair have done on some former occasions, while placing before you a summary of the progress made since our last meeting in these branches of knowledge, and delineating the leading features of their present, and the prospects of their future state. In this I should be sure to fail, and therefore I shall not attempt it, though I cannot help giving expression to my surprise and admiration of the astonishing developments which they have undergone, I will not say since the time when my own acquaintance with chemistry commenced by hanging in rapt enthusiasm over Maquer's Dictionary (which seemed to me in those early days a work of little short of superhuman intelligence); nor since the epoch when a Davy electrified the world by the decomposition of the alkalis; nor that when a Faraday commenced his magnificent career of discovery; or when a Berzelius first showed what might be done in giving precision to analysis—but since organic chemistry has assumed, by the experiments and reasonings of Dumas, Liebig, Hoffmann, and its other distinguished cultivators, that highly abstract and intellectual form under which it now presents itself, and which, by the links of the platina bases, and compounds such as those described by Gibbs and Genth under the name of the ammonio-cobaltic bases, and by those which are every day coming into view by the mutual interweaving, if I may use such an expression, of the organic and inorganic systems of composition in bases such as those of the metallic ethyls and those of boron and silicon—seems to place these conceptions in much the same sort of relation to the ordinary atomic theory as put forth by Dalton and Higgins, and the elementary notions of oxide, acid, and base of Lavoisier, that the transcendental analysis holds to common algebra. And here perhaps I may be tolerated if I put in a word of reclamation against the system of notation into which chemists, who for the most part are not algebraists, have fallen, in expressing their atomic formulæ. These formulæ have been gradually taking on a character

more and more repulsive to the algebraical eye. There is a principle which I think ought to be borne in mind in framing the conventional notations as well as nomenclatures of every science, at every new step in its progress,—viz.: that as sciences do not stand alone, but exist in mutual relations to each other—as it is for their common interest that there should exist among them a system of free communication on their frontier points—the language they use and the signs they employ should be framed in such a way as at least not to contradict each other. As the atomic formulæ used by the chemist are not merely symbolic of the mode in which atoms are grouped, but are intended also to express numerical relations, indicative of the aggregate weights of the several atoms in each group and the several groups in each compound, it is distressing to the algebraist to find that he cannot interpret a chemical formula (I mean in its numerical application) according to the received rules of arithmetical computation. In a paper which I published a long time ago on the Hypotheses, I was particularly careful to use a mode of notation which, while perfectly clear in its chemical sense, and fully expressing the relations of the groupings I allude to, accommodated itself at the same time perfectly well to numerical computation, no symbol being in any case juxtaposed, or in any way intercombined with one another, so as to violate the strict algebraical meaning of the formula. This system seemed for a while likely to be generally adopted; but it has been more and more departed from, and I think with a manifest corresponding departure from intelligibility. The time is perhaps not so very far distant when, from a knowledge of the family to which a chemical element belongs, and its order in that family, we may be able to predict with confidence the system of groups into which it is capable of entering, and the part it will play in the combination. A great step in this direction seems to me to have been lately made by Prof. Cooke, of the Harvard University, of the United States, (in a memoir which forms part of the 5th volume of the Memoirs of the American Academy of Arts and Sciences,) to extend and carry out the classification of chemical elements into families of the kind I allude to, in a system of grouping, in which the first idea, or rather the first germ of the idea, may be traced to a remark made by M. Dumas, in one of his reports to this Association, and which is founded on the principle of arranging them in a series, in each of which the atomic weight of the elements it comprises are found among the terms of an arithmetical progression, the common difference of which in the several series are 3, 4, 5, 6, 8, and 9 times the atomic weight of hydrogen respectively. So arranged they form six groups, which are fairly entitled to be considered natural families, each group having common properties in the highest degree characteristic; and what is more remarkable, the initial member in each group possessing in every case the characteristic property of the group in its most eminent degree, while the others exhibit that property in a less and less degree, according to their rank in the progression, or according to the increased numerical value of the atomic equivalent. Generally speaking, I am a little slow to give full credence to numerical generalizations of this sort, because we are apt to find their authors either taking some liberties with the numbers themselves, or demanding a wider margin of error in the application of their principles, than the precision of the experimental data renders it possible to accord, so that the result is more or less wanting in that close appliance to nature which makes all the difference between a loose analogy and a physical law; but in this instance it certainly does appear that the groups so arising not only do correspond remarkably well in their theoretical numbers with those which the best authorities assign to their elements, but that it really would be difficult to distinguish the elements themselves into more distinctly characteristic classes by a consideration of their qualities alone, without reference to their atomic numbers. When we find, for instance, that the principle affords us such family groups as oxygen, fluorine, chlorine, bromine, and iodine self-arranged in that very order; or again, nitrogen, phosphorus, arsenic, antimony, or bismuth; when we find that it packs

together in one group all the more active and soluble electro-positive elements, hydrogen, lithium, sodium, and potassium, and in another the more inert and less soluble ones, calcium, strontium, barium, and lead—and that without outraging any other system of relations, it certainly does seem that we have here something very like a valid generalization: and I shall be very glad to learn in the course of any discussions which may arise on such matters as may be brought before us in the regular conduct of our business from those more competent to judge than myself, whether I have been forming an overweening estimate of the value and importance of such generalizations. I will only add on this point, in reference to what fell from our excellent President in his address to the assembled Association last night, that this kind of speculation followed out would seem to me likely to terminate in a point very far from that which would regard all the members of each of these family groups as allotropes of one fundamental one, inasmuch as the common difference of the several progressions which their atomic weights go to make up, are neither equal to nor in all cases commensurate with the first terms of these progressions. For instance, in the chlorine group, the first term being 8, the common difference is 9. Something very different from allotropism is surely suggested by such a relation. It would rather seem to point to a dilution of energy of one primary element by the super-addition of dose after dose of some other modifying element, and this the more strikingly since we find oxygen standing at the head of very distinct groups having very striking correspondences in some respects, and very striking differences in others. But all these speculations take for granted a principle, with which I must confess I think chemists have allowed themselves to be far too easily satisfied, viz., that all the atomic numbers are multiples of that of hydrogen. Not until these numbers are determined with a precision approaching that of the elements of the planetary orbits,—a precision which can leave no possible question of a tenth or a hundredth of a per cent., and in the presence of which such errors as are at present regarded as tolerable in the atomic numbers of even the best determined elements shall be considered utterly inadmissible,—I think, can this question be settled; and when such gigantic consequences—so entire a system of nature is to be based on a principle—nothing short of such evidence ought, I think, to be held conclusive, however seductive the theory may appear. I do not think such precision unattainable, and I think I perceive a way in which it might be attained, but one that would involve an expenditure of time, labour, and money, such as no private individual could bestow on it. If the phenomena of chemistry are ever destined to be reduced under the dominion of mathematical analysis, it will, no doubt, be by a very circuitous and intricate route, and in which at present we see no glimpse of light. We should, therefore, be all the more carefully on the watch in making the most of those classes of facts which seem to place us, not indeed within view of daylight, but at what seems an opening that may possibly lead to it. Such are those in which the agency of light is concerned in modifying or subverting the ordinary affinities of material elements, those to which the name of actino-chemistry has been affixed. Hitherto the more attractive applications of photography have had too much the effect of distracting the attention from the purely chemical question which it raises; but the more we consider them in the abstract, the more strongly they force themselves on our notice; and I look forward to their occupying a much larger space in the domain of chemical inquiry than is the case at present. That light consists in the undulations of an ethereal medium, or at all events agrees better in the characters of its phenomena with such undulations, than with any other kind of motion which it has yet been possible to imagine, is a proposition on which I suppose the minds of physicists are pretty well made up. The recent researches of Prof. Thomson and Mr. Joule moreover have gone a great way towards bringing into vogue, if not yet fully unto acceptance, the doctrine of a more or less analogous conception of heat. When we

consider now the marked influence which the different calorific states of bodies have on their affinities—the change of crystalline form effected in some by a change in temperature—the allotropic states taken on by some on exposure to heat—or the heat given out by others on their restoration from the allotropic to the ordinary form (for though I am aware that Mr. Gore considers his electro-deposited antimony to be a compound, I cannot help fancying that at all events the state in which the antimony exists in it is an allotropic one),—when, I say, we consider these facts in which heat is concerned, and compare them with the facts of photography, and with the ozonization of oxygen by the chemical rays of the electric spark, and with the striking alterations in the chemical habits of bodies pointed out by Draper, Hunt, and Becquerel; and when again we find these carried so far that, as in the experiments of Bunsen and Roscoe, we find the amount of chemical action numerically measuring the quantity of light absorbed—it seems hardly possible not to indulge a hope that the pursuit of these strange phenomena may by degrees conduct us to a mechanical theory of chemical action itself. Even should this hope remain unrealized, the field itself is too wide to remain unexplored, and, to say nothing of discovery, the use of photography merely as a chemical test may prove very valuable, as I have myself quite recently experienced, in the evidence it has afforded me of the presence in certain solutions of a peculiar metal having many of the characters of arsenic, but differing from it in others, and strikingly contrasted with it in its powerful photographic qualities, which are of singular intensity, surpassing iodine, and almost equalling bromine. There is another class of phenomena which, though usually considered as belonging peculiarly to the domain of general physics, and so out of our department, seems to me to want some attention in a chemical point of view. It is that of capillary attraction. The co-efficient of capillarity differs very remarkably in different liquids, and no doubt also in their contacts with different solids, a fact which can hardly be separated from the idea of some community of nature between the capillary force and those of elective attraction. I hardly dare to hint at the existence of some slight misgiving I have always felt as to the validity of the received statical theory of capillary action, which carries with it the authority of such names as those of Laplace and Poisson. Any discussion of this point would be matter for another Section of this Association; and if I here touch upon it it is only to observe, that my impression of the requisiteness of a force so far allied to chemical affinity as to be capable of saturation, rests on other grounds besides that of the mere diversity of action above alluded to. But I must remember that you are not met here to listen to generalities, of whatever nature, but that we have plenty of real and special business before us. In the several papers which will be brought before this Section—in the elucidation their authors will personally afford, and in the discussions which will take place on them—I look forward to rich accessions to our knowledge, and to pregnant and fertile suggestions which will afford us matter of fruitful meditation hereafter; and I am very sure, that in the course of such discussion as may involve differences of opinion, that spirit of mutual and amicable concession which has always characterized the meetings of this Section will continue to prevail.

'On M. de Luca's claim to be the Discoverer of the Non-Presence of Iodine in the Atmospheric Air, Rain-Water, and Snow,' by Dr. STEVENSON MACADAM.—The author brought the matter forward, as M. de Luca had lately claimed, in the *Journal de Pharmacie*, the honour of the discovery. In 1852, Dr. Macadam stated, in a communication to the *Edinburgh Journal*, that he had examined twelve gallons of rain-water, and could not find the slightest traces of iodine. In 1853, he disputed Chatin's statement, that iodine was present in rain-water and the air, after having unsuccessfully sought for it in thirty-six gallons of rain-water, and failed to detect it in the air, by exposing to its action the metals most likely to be iodized. According to Luca's own account of his

very accurate researches, he did not commence them till six months after Dr. Macadam had published the result of his experiments.

'On an Improved Electric Lamp, invented and manufactured by Mr. W. Hart, Edinburgh.'

Prof. FARADAY objected to the construction of the lamp. The great requisite in electric lamps was a regulator, independent of the hand, to keep the charcoal points the proper distance from each other.

'Note on the Production of a Frosted Surface on Articles made of Aluminium,' by Dr. MACADAM.—Some aluminium had a short time ago been obtained for the purpose of making medals. When the medals were struck, a peculiar grey appearance was noticed on their surface, which it was supposed arose from the uncleanness of the die. Close examination, however, showed that this was not the case. Some of these medals were subjected to the action of hydrochloric acid and nitric acid separately, without producing much effect on their surfaces. When some of them were put in a solution of caustic potash they were acted on very violently, hydrogen being evolved, and the surface of the metal becoming beautifully frosted. This phenomenon of an alkali comporting itself to a metal as acids do, was worthy of the attention of chemists. After aluminium has been frosted in this manner, it does not become tarnished on exposure to the action of the air.

Mr. F. CRACE CALVERT considered the greatest objection to the use of aluminium in the arts arose from the fact that it decomposed rapidly in water, at 212°, and indeed at all temperatures more or less. A wire of aluminium which he had left closed in a tube of water for twelve months had become converted into gelatinous alumina. He found that aluminium, mixed with a small portion of iron, was less acted on by water than when pure.

'On the Effects produced on Glass, by exposure to the Action of Mud in Water,' by Dr. C. W. BINGLEY.—Along with several other articles lately found in the lake at Walton Hall, near Wakefield, were a piece of window glass and the remains of an antique bottle. It is supposed that they have been buried in the mud ever since the hall was attacked by Oliver Cromwell's soldiers. The interest these specimens possessed, in a scientific point of view, consisted in the remarkable appearance they presented after their submersion, possessing hues of colour rivaling those of the finest specimens of pearl shells. The mud in which they had been embedded contained a large quantity of organic matter and sulphide of hydrogen. On scraping the glass with a penknife the coloured part was easily detached in minute scales, those exhibiting the red or deep orange rays of colour coming off easily, when green or bluish scales became disclosed to view, which were with more difficulty removed. The glass underneath appeared as if it had been ground, or subjected to the action of hydrofluoric acid. The scales consisted of silicates of lime with iron, but with no potash or soda. The glass consisted of a silicate of potassa and soda, with a very slight trace of iron and lime. The glass appeared originally to have been a pure alkaline silicate. The potash originally in it appeared to have been replaced by lime and iron derived from the water, in the case of the detached scales. It has been known for a long time that water acts more or less on glass, slowly decomposing it into a soluble alkaline silicate. Scheele observed that water which had been boiled a long time in glass vessels became alkaline. Ebelman published, some time ago, an account of the strong action of water charged with carbonic acid on glass. That ammonia assists the action of moisture or water very materially may frequently be evidenced in the case of stable windows. It is possible that, in the present case, the silica of the glass after the separation of the alkali may have been left in a gelatinous state, as a condition necessary for its subsequent combination with lime and iron, derivable from the water, to form the less soluble silicate of which it is constituted. The glass, viewed by transmitted light, exhibited rays of colour complementary to the reflective rays. The various colours doubtless owe their origin to the different refractive powers of each of the scales, according

to the degree of thickness, the red or deep red orange rays being produced by the thickest of them.

On Chloro-arsenious Acid and some of its Compounds, by Dr. W. WALLACE.

On the Alkaline Waters of Leeds, by Mr. W. HUGGON.—Mr. Huggon gave the results of an analysis of a gallon of water from Ripley's Well, Holbeck. This alkaline water appears to contain a larger amount of alkaline matter than any in England. The nearest approach to it is the water of the artesian well in Trafalgar Square, which, according to the analysis of Abel and Rowney, contains 18 grains of carbonate of soda in the gallon, and 20 grains of the whole solid matter is chloride of sodium.

The Rev. W. V. HARCOURT said that the artesian well in the neighbourhood of York give water containing a large quantity of carbonate of iron and carbonate of soda, and when used for the generation of steam is very detrimental to the boilers, as it deposits in them rapidly a thick crust.—In answer to the PRESIDENT, Mr. MORLEY said that the Leeds waters were not detrimental to health.

SECTION C.—GEOLOGY.

President—W. HOPKINS.

Vice-Presidents—General PORTLOCK, Lord ENNISVILLE, Sir P. ELLIOTTON, Prof. RABAY, Sir J. NICOL, H. C. SORBY, E. W. SHAW. Secretaries—Prof. Phillips, Prof. Harkness, T. W. Embleton, J. G. Marshall, T. P. Teale, C. Morton, T. Wilson, R. Mallet, E. Chambers, D. Page, Prof. Rogers, T. Supple, C. Moore, W. Pengelly, W. T. Aveline, J. Woodall, E. W. Binney, A. Gages, F. Jennings, Col. James, C. B. Rose, J. Yeates, Dr. Bigsby, Dr. Bevan, Dr. Anderson, J. W. Salter.

The PRESIDENT said the existence of mammalian life in its earlier stages on the surface of our planet, the condition of its existence, and the period of its introduction, have always furnished questions of the highest philosophical as well as paleontological interest. You will be aware that some geologists regard each new discovery of mammalian remains, in formations preceding the older tertiary, as a fresh indication of the probable existence of mammalia in those earlier periods in which no positive proof of their existence has yet been obtained; while others regard such discoveries only as leading us to an ultimate limit, which will hereafter define a period of the introduction of mammalia on the surface of the earth, long posterior to that of the first introduction of animal life. Be this as it may, every new discovery of the former existence of this highest class of animals must be a matter of great geological interest. An important discovery of this kind has recently been made, principally by the persevering exertions of Mr. Beckles, who has detected in the Purbeck beds a considerable number of the remains of small mammals. The whole of them are, I believe, in the hands of our President, Prof. Owen, for the determination of their generic and specific characters; but Dr. Falconer seems already to have recognized among them seven or eight distinct genera, some of them marsupial, and others probably placental, of the insectivorous order. I may also notice, as a matter of great paleontological interest, the recent discovery of a new Ossaferous Cave, near Brixham, in Devonshire, of which some account is to be brought before us during this meeting. The past year has been fruitful in paleontological researches. The subject of the motion of glaciers is one of interest to geologists, for unless we understand the causes of such motion, it will be impossible for us to assign to former glaciers their proper degree of efficiency in the transport of erratic blocks, and to distinguish between the effects of glacial and of floating ice, and those of powerful currents. An important step has recently been made in this subject by the application of a discovery made by Mr. Faraday, a few years ago, that if one lump of ice be laid upon another, the contiguous surfaces being sufficiently smooth to insure perfect contact, the two pieces in a short time will become firmly frozen together into one continuous transparent mass, although the temperature of the atmosphere in which they are placed be many degrees above the freezing temperature. Dr. Tyndall has the merit of applying this fact to the explanation of certain glacial phenomena. There are two recognized ways in which the motion of a glacier takes place: one by the sliding of the

whole glacial mass over the bed of the valley in which it exists; and the other by the whole mass changing its form in consequence of the pressure and tension to which it is subjected. The former mode of progression is that recognized by the sliding theory; the second is that recognized by what has been termed the viscous theory of Prof. Forbes. The viscous theory appeared to be generally recognized. Still, to many persons it seemed difficult to reconcile the property of viscosity with the fragility and apparent inflexibility and inextensibility of ice itself. On the other hand, if this property of viscosity, or something of the kind, were denied, how could we account for the fact of the different fragments, into which a glacier is frequently broken, becoming again united into one continuous mass? Dr. Tyndall has, I conceived, solved the difficulty. Glacial ice, unlike a viscous mass, will bear very little extension. It breaks and cracks suddenly; but the separate pieces when subsequently squeezed together again become by regelation (as it is termed) one continuous mass. After some general remarks on the cause of the laminous structure of glaciers, during which he remarked that there was no doubt Dr. Tyndall was right in supposing the laminae of blue and white ice to be perpendicular to the directions of maximum pressure, he said that it remained to be decided whether the explanations which had been offered were correct; but the actual perpendicularity of the laminae of ice to the directions of maximum pressure within a glacier, and the probable perpendicularity to those directions of the laminae in rock masses of laminated structure, would seem to establish some relation between these structures in rocks and glacial ice, giving an interest to this peculiar structure in the latter case, which it might not otherwise appear to possess for one who should regard it merely as a geologist.

On the Comparative Geology of Hotham, near Cave, by the Rev. T. W. NORWOOD.—He contended, on the evidence both of lithological structure and fossils, that the oolite of Hotham Quarry is not Bath oolite, as has hitherto been said, but the lower part of the inferior oolite.

On the Marine Shell Bed of the South Wales Coal Basin, by Mr. G. P. BEVAN.

On the Geology of a Part of Lincolnshire hitherto unexplained, by the Rev. E. TROLLOPE.—His remarks were confined to the coast near the Wash, and he said there were abundant evidences of the alternate submergence and elevation of a large part of the district within the human period, which he attributed to volcanic causes.

Prof. OWEN said that some time ago he was sent for to the north, to examine a fossilized tree, which had been found in digging the Jarroo Dock, which bore undoubted evidence of having been cut by human hands. It was supposed to be a most important discovery, as showing the antiquity of the human race; and at first everything appeared satisfactory. On prosecuting his inquiries, however, he learned that one of the navvies, not then on the works, was said to have discovered a similar tree in another part of the dock, which he cut, to lay down a sleeper. The man was sent for; and, on his arrival, he declared that the tree pointed out was the one he had cut. It was endeavoured to be explained that that was impossible, as the place had not been excavated before; but, looking with supreme contempt upon the assembly of geologists and engineers, the man persisted in the identification of his own work, and exclaimed, "the top of the tree must be somewhere,"—upon which he (Prof. Owen) offered half-a-crown to the first navvy who would produce it. Away ran half-a-dozen of them; and, in a few minutes, they returned with the top. This explained the mystery. The man had cut off the top with his spade; the stump afterwards got covered up with silt, and, on being again uncovered, it was supposed to be a great discovery. Never had he so narrow an escape from introducing a "new discovery" into science, and never had he a more fortunate escape.

On the Geology of the Scilly Islands, by the Rev. F. F. STATHAM.

On the Effect of Currents in producing the Structure of the Millstone Grit, by Mr. H. C. SORBY.

SECTION D.—ZOOLOGY AND BOTANY, INCLUDING PHYSIOLOGY.

President—C. C. BABINGTON.

Vice-Presidents—Sir W. JARDINE, Sir J. RICHARDSON. Secretaries—Dr. LANKESTER, H. DENRY, Dr. HEATON, Dr. WRIGHT. Committee—Rev. T. HINCKS, F. H. WEST, C. G. WHEELHOUSE, Dr. Alexander, N. E. WARD, T. C. EYTON, Dr. THORP, J. TEALE, T. NUNNLEY, R. M. ANDREW, T. P. TEALE, JAR, G. S. WORTHY, Rev. H. H. HIGGINS, Dr. COLLINGWOOD, J. CLARK, A. STRICKLAND, H. F. STANTON, F. L. SCHAEFER, G. M. HUMPHRY, H. DEANE, A. BRADY, Rev. CARON HEY, T. ALLIS, G. C. HYNDMAN, Sir P. ELLIOTTON, L. BARRETT, Dr. EDWARDS, J. WOLLEY, J. LUBBOCK, F. F. CARPENTER.

Mr. BABINGTON, on taking the chair, alluded to the illness of Mr. Darwin, as the cause of that gentleman not presiding over the Section as had been originally intended.—The proceedings of the Section were commenced by Dr. WRIGHT, who read a Report, from Prof. KINAHAN, 'On the Result of Dredging Operations in the Bay of Dublin.'—The Report was short, and deferred the communication of any positive results for another year.

Dr. WRIGHT also read a Report, from Prof. KINAHAN, 'On the Crustacea of the Dublin District.'—The list of Crustacea obtained in the Dublin Bay is very large, and the terrestrial species of Crustacea more numerous than are recorded in any other district of the British islands. The chief species wanted in the Dublin Bay are those which frequent deep water, and which will probably be yet found when the deeper parts of the Bay are better searched. The species burrowing in the mud had not been found. The following species are as yet noted only on the Dublin coast:—*Crangon Allmanni*, *Pandalus leptocephalus*, and *Iphimedia Eblanae*. *Crangon trispinosus* had not occurred in any other part of Ireland. *Crangon sculptus*, *C. fuscatus*, and *Periella denticulata*, found in Dublin Bay, are of extreme rarity in other parts of the British islands. Of ninety Irish species, Dublin affords sixty decapodous species, which are found in thirty genera. Of the thirty species not found in Dublin Bay, the majority are deep-water species. In conclusion, the author stated that he had succeeded in obtaining the zoea of several species, whose development he proposed to treat of in a second part of his Report.

Dr. LANKESTER drew the attention of the Section to the importance of accurately recording the results of dredging, as done by the tables drawn up by the Association. By this means a knowledge of the habits and localities of the various forms of sea-animals was being accumulated. This knowledge was of great practical importance, for it turned out that the persons most ignorant and prejudiced with regard to the habits of marine animals were those who obtained their livelihood by catching them; and it not unfrequently happened that laws relating to fisheries were passed at the instigation of these people, and much injury inflicted.

Sir J. RICHARDSON read a paper, from Dr. J. Davy, entitled 'Some Observations on the Fishes of the Lake District.'—In this paper the author referred—1st. to the habitats of the fish, remarking that the vendace, once supposed to be peculiar to Scotland, had been found in Derwentwater. 2nd. On the causes of the distribution of fishes. The case of the vendace was regarded as an example, and the explanation of its very local distribution attempted. The two theories regarded as most probable were, first, the transportation of the eggs by birds; secondly, the transference of ova from one district to another in floating ice. 3rd. The growth of the fish. Remarkable instances were recorded of the rapid growth of various kinds of fish under the influence of food. 4th. Of variations in the species of fish. Great varieties of colour and marking were produced by food. The paper concluded by pointing out the necessity of legislative interference to prevent the destruction of fish. They were now taken in larger quantities at the season when they were about to deposit their ova. A closed season should be instituted throughout the country, and parr and smolts should never be taken.

Sir W. JARDINE said, it was most important that a better knowledge of particular species of fish should be obtained. He was convinced that there was no fish that could be truly called a parr. It had been long since proved that the parr of Scotland were young salmon. The charr existed in the north of Scotland, but not in the south. They

would not take the fly, and could be only caught in nets. Whenever he had taken them their stomachs were filled with small entomostracous crustacea, and nothing else. Food produced a great effect on the appearance of fish. He believed the common salmon (*Salmo salar*) had not been found in Asia or the Mediterranean, but that the American species was identical. With regard to the vendace, it was at one time only known to exist in Loch Leven, in Scotland. It was not only found now in Derwentwater, but also in the Bala Lake, Wales.

—Prof. OWEN was anxious to record his sense of the value of the observations made by Dr. J. Davy. At the same time he wished observers like Dr. Davy would confine their whole attention to a single species of animal. They would then obtain the necessary amount of observation to come to definite conclusions, especially in reference to the question of species and varieties. He related the history of a large fish, sent to him by the late Sir Robert Peel, weighing 22½ pounds, and which had been taken in the Tame. Mr. Yarrell and himself regarded it as a specimen of *Salmo Eriox*; but the characters of that species were so ill-defined that the political baronet had equal chances with the naturalists in discussing its true relations.—The Rev. H. H. HIGGINS referred to the fact, that fishermen called some streams "breeding streams," where a large number of only small fish were found, and other streams as "feeding streams," where only a small number of large fish were found.—Sir J. RICHARDSON confirmed Dr. Davy's statement, that the eggs of fishes were not destroyed at the freezing point, but that they were killed at a temperature of 80°. The nearer the eggs were to hatching, the better able were they to bear change. He had ascertained the presence of the common salmon at Kamtschatka. Salmon could be easily increased in size by feeding. He knew a lady who had succeeded in obtaining remarkably fine trout by feeding them in a small pond with chopped liver and other salmon dainties of that kind.

'On Suburban Gardens,' by Mr. N. B. WARD.—He commenced his paper by describing the impressions made upon him in early youth, in a voyage to Jamaica, by the glorious aspects of the sea and sky,—the dolphins playing about the bows of the vessel,—the flying fish alighting on its deck, and the occasional sight of an albatross,—the tropical forms of vegetation on the beach and the hills, and the mighty world of wonders on the coral reefs. On his return to London he stated the great advantages he had received by accompanying the Professor of Botany, under the patronage of the Society of Apothecaries, in repeated herborizations round London, which gave him a great insight into the natural conditions of all the plants within five-and-twenty miles of London. On his establishment in Welles Square he endeavoured to fulfil these conditions in a kind of terraced garden on the roof of his brewhouse, but with indifferent success. This garden was destroyed by fire. A subsequent attempt to grow ferns and mosses proved equally unsuccessful from the influence of smoke. An accident led him to the employment of cases, sufficiently close to exclude soot and other impurities, and to retain the moisture. The first important application was the conveyance of plants to and from distant countries, which proved so successful as to be universally adopted. On his removal to Clapham, he found that he was enabled to grow great numbers of plants in the open air, by supplying them with proper food, &c.; and therefore restricted the use of the closed cases to such plants as could not with all his care be cultivated in the open ground. He expressed his belief that the cause of failure in the cases arose—not, as had been stated, from the quiet condition of the atmosphere—but from the much greater heat of the case, when exposed to the summer sun without a blind, the thermometer often rising from 20° to 25° higher than in the open air. When the sun is obscured the temperature in the cases is not more than from 2° to 15° higher. It is his firm opinion that where the natural conditions as regards heat, light, moisture, soil, and periods of rest are fulfilled, the undisturbed state of the air, so far from being prejudicial, is of great service. This fact he

has proved with numerous plants; and he will feel extremely obliged to those who will kindly communicate instances to the contrary. What strengthens Mr. Ward's conviction that heat is the cause, is the fact that in the spring and early summer months no cases of failure arose. Mr. Ward exhibited, among other plants, specimens of two fairy roses, the one having been in a case for three or four years, and the other above twenty.

Prof. OWEN expressed the great pleasure and satisfaction he had derived from recently inspecting Mr. Ward's suburban garden at Clapham. He had succeeded in growing plants in all their wild glory.

'On the Geological Distribution of Plants in some Districts of Yorkshire,' by Dr. CARRINGTON.—The chief tract taken for illustration was that part of Craven included between Gordale and Kingsdale, and cut off on the south by the magnificent line of scars known as the Craven fault. The physical and geological peculiarities of the district were minutely described. The origin of the present vegetation was referred to different periods; the more ancient portion, including plants of boreal type, being probably a remnant of the Pre-Glacial Flora. The species found in Craven are 600 flowering plants, and about 500 mosses and lichens. After considering the present state of our information as to the geognostic relations of plants, the following classification of strata was recommended, each group being characterized by a peculiar Flora:—1. Calcareous formations, highly absorbent, acted on by the elements chemically rather than mechanically (the carbonic acid in water dissolving the lime), forming a dry, scanty, but fertile soil; 2. Arenaceous formations, disintegrating freely, and producing an abundant sandy deposit, on a large scale, forming absorbent, barren stations; 3. Argillaceous formations, subject to rapid abrasion, forming clayey deposits, comparatively impermeable and hygroscopic. In practice we find these often mingled together, e.g. shales with sandstones; and the soils frequently differ in nature from the rocks they cover, having been derived from distant sources. The practice of agriculture has especially tended to mingle and equalize the soils of various districts. The prevailing rock of Craven is the scar limestone. It supports the greenest of pasturage, and most of the rare species are found on it, e.g. *Actea spicata*, *Draba incana*, and *D. muralis*, *Cardamine impatiens*, *Hutchinsia petrea*, *Hippocrepis comosa*, *Dryas octopetala*, *Saxifraga oppositifolia*, *Hieracium Gibsoni*, *Bartsia alpina*, *Primula farinosa*, *Epipactis ovalis*, *Cypripedium calceolus*, *Lastrea rigida*, and many characteristic mosses and lichens, especially important from growing directly on the rocks. *Limestone*: The prevailing lichens are species of *Collema*, such as *C. nigrum*, *stygium*, *fluviale*, &c., *Parmelia crassa*, *P. calcaria*, *Lecidea lurida*, *candida*, *immersa*, *saxatilis*, *calcaria*, &c., *Verrucaria immersa*, *Gagei*, *Dufourii*, *plumbea*, and *epipolea*. The sandstones are restricted to the millstone-grit, capping Ingleborough, and other summits, upwards of 2,000 feet high. They are covered by a coarse brown vegetation of ling, heath, crow-berry, bilberry, *Juncus squarrosus*, &c.—*Sandstone*: The lichens are brown and golden coloured, e.g. species of *Umbilicaria*, *Parmelia atra*, *olivacea*, *saxicola*, *badia*, *mucorum*, *Lecidea lapidea*, *confuens*, *prominula*, and *fuso-atra*, *B. rupestris*. The argillaceous rocks are represented by the Yoredale shales and Lower Silurian slates, exposed in Ribblesdale and Chapedale. They afford damp, dripping stations, supporting a scanty glaucous vegetation of *Equiseta*, rushes, and *Carices*, e.g. *Sedum Rhodiola* and *S. Telephium*, *Saxifraga aizoides*, *Carduus heterophyllus*, *Equisetum hyemale* and *variegatum*, *Allosorus crispus*, *Hymenophyllum Wilsoni*, *Scolopendrum ramosum*, &c.—*Slate*: *Parmelia conspersa*, *P. sulphurea*, *Sticta herbacea*, *sylvatica*, *scrobiculata*, *Nephroma*, *Lecidea confervoides*, *geographica*, *polytropas*, *rivulosa*.

'On the Death of the Common Hive Bee, supposed to be occasioned by a Parasitic Fungus,' by the Rev. H. H. HIGGINS.—On the 18th of March last a gentleman of Liverpool communicated to me some circumstances respecting the death of a hive of bees in his possession, which induced me to

request from him a full statement of particulars. He gave me the following account:—"In October last I had three hives of bees, which I received into my house. The doorway of each hive was closed, and the hive was placed upon a piece of calico; the corners were brought over the top, leaving a loop, by which the hive was suspended from the ceiling. The hives were taken down about the 14th of March; two were healthy, but all the bees in the third were dead. There was a gallon of bees. The two hives containing live bees were much smaller; but in each there were dead ones. Under whatever circumstances you preserve bees through the winter, dead ones are found at the bottom of the hive in the spring. The room, an attic, was dry; and I had preserved the same hives in the same way during the winter of 1856. In what I may call the dead hive there was abundance of honey when it was opened; and it is clear that its inmates did not die from want. It is not a frequent occurrence for bees so to die; but I have known another instance. In that case the hive was left out in the ordinary way, and probably cold was the cause of death. I think it probable that my bees died about a month before the 14th of March, merely from the circumstance that someone remarked about that time that there was no noise in the hive. They might have died earlier, but there were certainly live bees in the hive in January. I understand there was an appearance of mould on some of the comb. There was, I think, ample ventilation, indeed, as the hives were suspended they had more air than through the summer when placed on a stand. When the occurrence was first made known to me I suggested that the bees might probably have died from the growth of a fungus, and requested some of the dead bees might be sent to me for examination. They were transmitted to me in a very dry state, and a careful inspection with a lens afforded no indication of vegetable growth. I then broke up a specimen and examined the portions with a compound microscope, using a Nægel No. 4. The head and thorax were clean, but on a portion of the sternum were innumerable very minute linear slightly curved bodies, which, when immersed in water, showed the well-known oscillating or swarming motion. Notwithstanding the agreement of these minute bodies with the characters of the genus *Bacterium* of the *Vibronia*, I regarded them as spermata, having frequently seen others indistinguishable from them under circumstances inconsistent with the presence of conferva, as in the immature peridia and sporangia of Fungi. In the specimen first examined were no other indications of the growth of any parasite; but from the interior of the abdomen of another bee I obtained an abundance of well-defined globular bodies resembling the spores of a fungus, .00012–.00016 inch in diameter. Three out of four specimens subsequently examined, contained within the abdomen similar spores. No traces of mycelium were visible; the plants apparently had come to maturity and withered, leaving only the spores. The chief question then remaining to be solved was, as to the time when the spores were developed, whether before or after the death of the bees. In order, if possible, to determine this, I placed four of the dead bees in circumstances favourable for the germination of the spores, and in about ten days I submitted them again to examination. They were covered with mould consisting chiefly of a species of *mucor*, and one also of *Botrytis* or *Botryosporium*. These fungi were clearly extraneous, covering indifferently all parts of the insects, and spreading on the wood on which they were lying. On the abdomen of all the specimens, and on the clypeus of one of them grew a fungus wholly unlike the surrounding mould. It was white and very short, and apparently consisted wholly of spores arranged in a moniliform manner like the filaments of a penicilium. These spores resembled those first found in the abdomen of the bees, and did, I think, proceed from them. The filaments were most numerous at the junction of the segments of the abdomen. The spores did not resemble the globules in *Sporodonema musca*. The Rev. M. T. Berkeley, to whom I sent some of the bees, found, by scraping the interior of the abdomen with a lancet, very minute curved linear

bodies which he compared to vibrios. He found mixed with them globular bodies, but no visible stratum of mould. From the peculiar position of the spores, within the abdomen of the bees, and from the growth of a fungus from them unlike any of our common forms of Mucedines, I think it probable that the death of the bees was occasioned by the presence of a parasitic fungus.

'On the Liability of Shells to Injury from the Growth of a Fungus,' by the Rev. H. H. HIGGINS.—It has often been observed that shells kept for a considerable time in cabinets are apt to lose much of their original freshness and beauty of appearance. This kind of injury chiefly affects such specimens as have a bright enamelled surface, which at length becomes dull and less pleasant to the touch. Several suggestions have been made with reference to the probable cause of the change, which has often been attributed to the efflorescence of saline matter absorbed by the shell. But, so far as I have observed, the specimens most liable to injury from saline incrustation belong to genera in which the shells are without enamel, as *Littorina*, *Turritella*, &c., and many collectors are in the habit of steeping their specimens in fresh water for some days before placing them in their cabinets—a process which is said to be an effectual preservative from injury by saline efflorescence. Mr. Dennison, of Woolton, attributed the loss of lustre in enamelled shells to the ravages of a minute insect, but had not been able to detect the depredator. "Many of the shells in my own cabinet suffered such serious injury during last winter that I was led to investigate the cause, which, indeed, became obvious enough by the use of a microscope. An ordinary lens showed the enamel of the shell to be beset with small bristly points, and when a portion of the surface was scraped off and submitted to a higher magnifying power, the forms of at least two species of Fungi became apparent, one resembling an ordinary Mucor with a globose sporangium, the other, and much more common form, exhibited both simple and moniliform filaments, with an abundance of minute spores, seemingly quite free. After having been carefully washed, the surface of the shell was found to be as if it were engraved in some places with stellular marks, in others with striae forming irregular reticulations, caused no doubt in each instance by the spreading mycelium of the fungus. It is scarcely necessary to add, that attacks of this nature need not be apprehended where shells are kept in a perfectly dry or well ventilated place. A slight deposition of moisture does, however, frequently occur upon their surfaces whilst shells are undergoing examination, in which case it would be a safe precaution to allow them for awhile to remain exposed to the air before returning the drawer to the cabinet."

Mr. T. C. EYTON read a further 'Report on the Oyster,' continuing that which he began at the Meeting of the British Association held at Cheltenham. At that meeting he exhibited the young oyster taken from the beard of the parent. He now traced the young oyster from the embryo state in the ovary to its perfection at five years old; and exhibited a series of drawings made for a work on the history of the oyster, the mode of preserving the beds and increasing their productiveness, shortly to be published by Mr. Van Voorst.

'On the Bryology of the Oolite Hills of Yorkshire,' by Mr. J. H. DAVIS.

SUB-SECTION D.—PHYSIOLOGY.

President.—Sir R. BROWNE.

Vice-Presidents.—Dr. ALISON, T. F. TRALE, H. GREY, Dr. HODGKIN, Dr. CHADWICK, S. SMITH, Dr. ACLAND.

Secretary.—G. WHELDON.

Committee.—Dr. Hexton, Dr. Chadwick, J. I. Ikin, W. Hey, S. Hey, W. N. Prior, G. Morley, T. Nunneley, T. F. Trale, J. L. Smith, Dr. Acland, G. H. Lewis, Dr. Camps, Dr. Reynolds, Dr. Latham, J. Marshall, Dr. Jones, Dr. Smith, Dr. Hare, Dr. Lewis, Dr. Harley.

'On the Structure of the Choroid Coat of the Eye, and more particularly on the Character and Arrangement of the Pigmentary Matter,' by Mr. NUNNELEY.—The choroid coat is the dark tissue interposed between the delicate sentient retina and the hard, dense sclerotic, and co-extensive with the latter. It begins at the entrance of the optic nerve by a round aperture, with a distinct edge, in close apposition with the nerve, but not organically con-

nected with it, and passing forward as far as the junction of the sclerotic and cornea, where, as choroid proper, it terminates. It there comes in connexion with the ciliary circle or muscle, the ciliary body and the iris. The choroid is essentially a vascular membrane, being made up of blood-vessels, colouring matter, and a modified white fibrous tissue. The choroid universally provided the pigmentary nigrum, and is of a deep bronze colour, approaching to black. The pigment was described as consisting of two distinct forms of cells,—on the inner surface the choroid, of true hexagonal cells, and in the tissue, and on the posterior surface, of stellate cells. The use of these cells was to destroy the light as soon as it had acted on the retina; and they were the most perfect absorbers of light of any substance in Nature that he knew of. From the account he gave of the arrangement of the pigment, it afforded what he considered a satisfactory anatomical explanation of an abnormal condition of the eye which had hitherto not been understood, viz. *Musca volitans*. The figures of those moles he believed to resemble exactly portions of the choroid coat when teased out; and they might be expected to appear and disappear with the varying condition of the vessels arising from disordered stomach or the cerebral circulation, and be cured by whatever corrects those conditions; or the muscae might result from different organic changes in the choroid coat, which are incapable of being removed.

SECTION E.—GEOGRAPHY AND ETHNOLOGY.

President.—Sir R. MURCHISON.

Vice-Presidents.—Major-General CHENEY, J. CRAWFURD, Admiral FitzRoy, Rev. Dr. HOOK, Sir H. RAWLINSON, Sir J. RICHARDSON.

Secretaries.—Dr. NORTON SHAW, T. WRIGHT, E. GALTON.

P. McLAGRAN, R. TYLE.

Committee.—T. W. Atkinson, Dr. Barker, Dr. Bingley, C. H. Bracebridge, J. Botterell, J. Brown, Consul Brand, Sir H. Bredie, Dr. Camps, J. W. Childers, C. Westwood, Dr. Clarke, Capt. Endacott, Viscount Goderich, Dr. Gorman, Admiral P. Grace, C. H. B. Hambly, Rev. T. Himeke, F. Hindmarsh, Dr. Hodgkin, Rev. Dr. Jones, T. Irving, Col. James F. M. Jennings, Dr. Leitham, Dr. Lee, J. Locke, W. Lockhart, C. R. Markham, M. H. Marsh, J. Mayer, R. Monckton Milnes, Sir C. Nicholson, Capt. Nolloth, W. Osborn, Jun., Admiral Sir J. Ross, E. C. Ravenshaw, Sir J. R. Shuttleworth, A. B. St. John, J. J. Stainton, Consul Sirzebecki, R. Stephenson, T. Sewth, Dr. Thurman, Rev. E. Trollope, W. S.W. Vaux, J. K. Watts, J. A. Warre, T. Wilson, J. Yeats.

Sir R. L. MURCHISON had attended twenty-five annual meetings of the British Association, but he regretted that, owing to the state of his health, he was in Germany at the time that the meeting of the Association was held last year. He knew, however, that amongst the distinguished men who were there was the Rev. Dr. Livingstone, and he would conclude by reading a letter which he had received from that distinguished traveller. He read extracts from a long letter written to him by Dr. Livingstone, dated the 24th of June last, which was encouraging, and the principal subjects mentioned in it had reference to the river Zambesi. It appeared that the anticipations of a great amount of fever prevailing on that river during the hot season had, happily, not been realized. During Dr. Livingstone's six weeks' stay on the river not a single case of fever had occurred, and the Zambesi had proved to be an exception to the generality of rivers in Africa. These statements were confirmed in another letter, which he (the President) had received from the commander of one of the ships forming the Expedition with which Dr. Livingstone went out.

'On the Effects of Commixture, Locality, Climate, and Food on the Races of Man,' by Mr. J. CRAWFURD.—The writer gave a review of the commixture of various nations, its effects on the mental faculties of the different populations, their physical characteristics, and language. He glanced at the effects of a change of climate upon any particular race. It did not appear, he said, that colour and the more prominent physical attributes, or mental capacity, had any necessary connexion with climate; nor did he think that climate altered the physical form and mental faculties of a race transferred from its original locality to a new one. He then pointed out, at some length, that the varieties of climate had a great influence upon the mental powers of a people; and proceeded to consider, under the last head of his paper, the question of diet in relation to the physical and mental character of a people. The physical character of a race, he said, did not seem to be in any respect altered by the nature of the

vegetable diet of which it partook, provided the quantity were sufficient and the quality wholesome, but when the question of the diet of a people related to mental development, the quality assumed an important aspect. No race of man, it might be safely asserted, ever acquired any respectable amount of civilization that had not some cereal for a portion of its food.

In answer to observations made by Mr. WARRE, Mr. CRAWFURD said he believed there was no question that cannibalism had existed in various parts of the world. It appeared generally to have prevailed amongst those tribes which were to a great extent destitute of animal food. It had, however, undoubtedly prevailed even where there was no scarcity of animal food. He believed that the practice was decreasing, and in the southern and middle portions of New Zealand it had not only been given up by the natives, but they were absolutely ashamed of it.

'On the Geography of British North America, more particularly British Columbia, Frazer River, &c.' by Dr. NORTON SHAW.—He gave an account of the various discoveries which have been made in North America, alluding minutely to those made since the cession of Canada by France to Great Britain in the year 1763, and then proceeded to describe the geographical position of the Frazer River, the boundaries and limits of British North America, the mountains of the coast, called the Rocky Mountains, and British Columbia. Speaking of British Columbia, he said that the face of the country presented a succession of mountain ridges, valleys, and plains, the more fertile districts lying, for the most part, between the Cascade Mountains and the ocean. That portion of the country which lay between the Cascade Mountains and the Pacific was subject to a remarkably equal temperature, the mean being about 54° Fahr. There was only about four months of winter, and all fruits and vegetables were as early as in Canada. In many respects the climate of the middle section was less favourable: it was subject to droughts, and was warmer in summer and colder in winter. The air, however, was pure and healthy. The eastern section, under the snows of the Rocky Mountains, could not be praised for its climate. The western section was well adapted for agricultural and horticultural operations. The eastern section was favourably spoken of; and in the course of his remarks about the Frazer River, Dr. Shaw stated that it abounded in fish, as also did the other rivers in the district. Geese, ducks, and waterfowl were plentiful in the spring and summer. In the western section of the country wild animals of various kinds were met with in great numbers.

Sir J. RICHARDSON feared that the discovery of gold in the vicinity of Frazer River would tend to sweep the Indians from the face of the earth, as had been the general result of the influx of the white man into the territories of the red man.—Lord GODERICH believed that that portion of the British possessions which had been referred to was of great political and national importance. A Committee of the House of Commons, of which he was a member, came to the conclusion, about eighteen months ago, that the country on both sides of the Rocky Mountains, particularly westward of them, might be made in a short time available for colonization, and the discovery of gold had decided the question. Many English people had already entered the country; and as it appeared, from the highest authorities, the district was likely to yield a large supply of gold, no doubt the number of emigrants thither would largely increase. The favourable situation of the country was increased from its contiguity to the United States; and he observed that some attention had been directed to the practicability of constructing a line of railway through the whole of the British possessions in that part of the world, from Canada, over or through the Rocky Mountains, to the Pacific.—Prof. TENNANT alluded to the difference in the value of the gold obtained in Australia and California, and that which had been found in British Columbia. He said that Australian gold was worth 4*l.* an ounce; Californian, 3*l.* 15*s.*; and that got from the Frazer River district, 3*l.* 11*s.* He strongly urged that attention should be directed to the importance

of procuring other metals besides gold, such as copper, tin, silver, &c., which were frequently to be found in the ore from which gold was obtained, and which would prove as remunerative as what was generally considered the more precious metal.—Lieut.-Col. JAMES, the Superintendent of the Ordnance Survey, gave a statement of the steps which have been taken by Government for the exploration of the new colony of Columbia. He expressed a belief that the men who were making that survey, by uniting the qualifications of the soldier and the artificer, would be enabled to preserve order in the country, and also to assist in providing those necessary appliances for the establishment of a new colony.

'On the Navigation of the Ucayali, an Affluent of the Amazons,' by Mr. C. R. MARKHAM.

SECTION F.—ECONOMIC SCIENCE AND STATISTICS.

President—E. BAILEY.

Vice-President—Col. SYKES, J. HEYWOOD, W. S. AYRTON, D. LUTON, Sir J. K. SHUTTLEWORTH.

Secretaries—W. NEWMARCH, Dr. STRANG, Prof. CAJESSE, Capt. FISHBOURN, T. B. BAILEY, S. BROWN.
Committee—Prof. Alexander, E. Ashworth, R. Baker, Dr. Batesman, T. Bailey, Rev. Dr. Booth, C. H. Brachridge, Dr. Canjia, E. Chadwick, J. E. Dobb, C. Wentworth Dilke, W. Dunsell, W. E. Forster, J. Hole, J. A. Ikin, T. J. Kinnear, G. Legman, Dr. Lewis, H. Mann, Lord Montezale, W. Murray, W. Nield, F. G. P. Nelson, J. Shuttleworth, W. M. Tait, Rev. E. Watkins.

The PRESIDENT said—If the British Association were a theatre for intellectual display, I should shrink from occupying a chair in which I have had such distinguished predecessors. But if I understand the spirit of this Association, it is the simple, honest, earnest pursuit of truth—first, of truth in facts, and secondly, of truth in principles; and it would be quite foreign to that spirit either to attempt anything of display or to apologize for its absence. I shall be permitted, however, to welcome the disciples of economical and statistical science on their visit to this important centre of industry, where practical illustrations may be found of many branches of their subject, and where, I hope, there are many who can value their inquiries. After the remarks made last night by the President of the Association, it may seem superfluous to say anything further on the claims of that science which he pronounced to "bear more immediately than any others on the prosperity of nations and the well-being of mankind." We must all have felt how unanswerably the President proved the value of economical and statistical science, when he referred to the department of vital statistics, and showed what terrific losses had been sustained by our army and navy and the army of France, from the neglect of sanitary rules. But I may just remark that what gave to the recent report of Mr. Sidney Herbert's Commission on the health of our troops in barracks its resistless force was, the certainty and precision with which statistical researches enabled it to measure the amount of loss sustained, by comparison with the mortality in other classes of the population at the same ages. The report might have dwelt on sickness, on injudicious diet, on defective ventilation, on want of drainage, and so forth, and all such statements would have been pronounced to be exaggerations or errors; but when it applied the ascertained scale of mortality, so as to prove that there were so many deaths in the thousand when there ought only to have been half that number, the definiteness of the figures and facts defied evasion, fastened on the public mind and conscience, and compelled immediate measures of reform. Those persons who have ignorantly charged upon political economy and statistics a disregard of moral considerations and of humanity may now see how egregiously they were mistaken, and how the arithmetic which they thought so heartless is rising up as the most powerful advocate of the value of human life, of health, of domestic comfort, of temperance, of virtue, of proper leisure, of education, and of all that can purify and elevate society. I am glad to know that we shall have one or more papers on important points of vital statistics laid before this Meeting. May I for a moment refer to another reproach thrown upon statistics, namely, that they may be so used as to prove anything? I hardly need say that it is unfair to argue from the abuse of a thing against its proper use. But it may be admitted, that there is sufficient ground for this

reproach, in the negligent or dishonest use sometimes made of statistics, to call upon us for the exercise of great caution, so that in the first place we may be sure we have got all the facts that are essential, and in the next place that we draw from them sound and accurate conclusions. The statistic ought to remember how liable are loose and defective masses of figures to be used by both sides in controversy, each picking up such as suit him wherewith to pelt his antagonist. It is valuable to collect facts, but it is still more useful to ascertain that they are exact and complete, and then so to arrange them that they may serve to build up some useful structure. A statistic ought to lay a charge upon his conscience, as though he were sworn in the form of our old oath to speak "the truth, the whole truth, and nothing but the truth." Nor can we be too careful to reason fairly and soundly from the facts we may amass; for it is the facts of the statistic and the doctrines founded upon them by the economist, which, to a great extent, guide our practical legislation, and thus affect the great interests of society. I cannot refrain from expressing my conviction that as the science we cultivate has been shown to be favourable to humanity, so it is no less favourable to freedom. Within the last quarter of a century how busy has it been in knocking off all sorts of fetters from human energies!

'Water Supply to Great Towns—its Extent, Cost, Uses and Abuses,' by Dr. J. STRANG.

'Trade and Commerce the Auxiliaries of Civilization and Comfort,' by Mr. T. BAZLEY, of Manchester.—Mr. Bazley sketched the rise and progress of the cotton trade, as confirming and supporting the views enunciated in the title of this paper. In 1758 the imports of cotton and its consumption by domestic labour might be three millions of pounds weight for the entire year, but in the present year, a century afterwards, the quantity consumed would be one thousand millions of pounds, of which the United States supplied three-fifths, the other two-fifths being obtained from the East Indies, South America, Egypt and the West Indies. For the last year, by the return made by the Board of Trade, the exports of cotton manufactures sent to every part of the world amounted to upwards of thirty-nine millions pounds sterling. Hence this large sum became the agent of payment to a corresponding extent of imports, but in thus largely aiding in procuring increased supplies of foreign products, whether in gold, silver, raw materials, food, wines, sugar, fruits, or luxuries of distant growth which are received into the United Kingdom, there was the satisfaction that our cotton industry had contributed clothing comforts to the benefit alike of the savage and civilized in every region of the earth. In this current year the exports of cotton manufactures would perhaps amount to forty millions value, and the portion left for home consumption might be twenty millions, or equal to 17s. per head for the population of this country; but as the cotton trade of Great Britain is not half its magnitude in the entire world, including the domestic and semi-domestic manufacture still extensively carried on in the East, the manufacture of the world at large could not be less than the annual value of one hundred and forty millions, and therefore this industry afforded to the world's population 3s. worth each of cotton clothing, or, represented in calico, fourteen yards per annum for every man, woman and child in existence. Presuming the cotton industry of this country to amount to sixty-four millions in value for the current year, and the cost of the raw material to be twenty-four millions, then the sum remaining for wages, interest of capital, rent, taxes, fuel, freight, carriage and other requisites, would be forty millions. The population employed in this trade exceeds half a million, and as every worker is said to be connected in his family with three non-workers, who depend upon the single worker for subsistence, two millions of people are therefore supported by it. Engineers, founders, machine-makers, and other auxiliary traders employ vast numbers of well-paid workmen, who are constantly engaged and sustained at the cost of the capital invested in the constructive department of the cotton trade; hence these further sources of support increase the total number

of people dependent upon this extraordinary industry. Viewing Lancashire as the chief seat of this industry, if we referred to its population a hundred years ago, we found it to have been about 300,000, whilst now it was 2,300,000, making an increase greatly in excess of any of the old trading and agricultural communities of this or any other country. After noticing the numerous other places in different counties of England and Scotland in which the manufacture of cotton has become the great support of labour, Mr. Bazley proceeded to discuss the question of increasing the supplies of the foreign raw material, and urged the importance of opening up new fields for its cultivation. Africa and Asia could grow more cotton than the most sanguine could contemplate the demand of the whole world would ever require; and to extend its production in those two quarters of the globe would be at the same time to extend civilization and to diffuse the comforts of life. Workpeople, manufacturers, merchants, statesmen, and philanthropists had all the deepest interest in this vital question, but which hitherto had been shrouded in almost fatal apathy. At home and abroad the wonder was that the British East and West Indies had not supplied the largest portion of the cotton needed in this country. For much of the unproductiveness of those portions of the British empire misgovernment was responsible. Roused, however, by the salutary influences of public opinion, the legislature of our country had given to the East Indies a new existence. No intermediate spoiler would hereafter prevent the Queen and a direct executive from developing the resources of India. An enlightened and just policy applied to every British colony would yield the benefits of an extended commerce, blessing, like charity, those who gave and those who received.

'On the History of Prices of 1857 and 1858,' by Mr. W. NEWMARCH.—Mr. Newmarch said that at the meeting of the British Association in Dublin last year, a paper was read by him on a subject somewhat analogous to the paper he had to submit to the present Meeting. On that paper a discussion arose, and many of the opinions he had advanced were somewhat vehemently contested. One of the statements he made at Dublin last year, and the statement probably which obtained the least amount of adhesion at the time, was to the effect, that the high-range prices which were prevailing last year at this time as regarded nearly all classes of commodities was a range of prices which had not been occasioned and which did not prevail in consequence of the large numerical addition made since 1848 to the quantity of the circulating medium in the world, meaning by "circulating medium" metallic money, but was to be attributed in the largest degree and in the greatest number of instances to an excessive, and he ventured to say at that time, a vicious application of capital and credit to speculation in commodities. Since that statement was made events had taken place to which he need not in the town of Leeds refer. He might refer to them, however, so far as to say he imagined he should not, on this occasion, meet with so much hesitation as regarded the particular doctrine he laid down last year. After drawing attention to the extent and severity of the commercial crisis of 1857, and to the difference between it and previous crises during the last thirty years, Mr. Newmarch referred to a table of the wholesale London prices of certain leading articles of consumption in 1855, 1856, 1857, and 1858. From the tabulated statement it appeared that as a rule the prices at the present time are not only lower than they were in 1857, but in some of the more important cases lower than they were in January 1851. The lapse of seven years from the early part of 1851 to the present time, so far from tending to produce a rise in prices, had rather tended to produce a fall. He asked the Meeting to bear in mind another fact, that during those seven years there had been added to the previous stock of gold and silver existing in the commercial capitals of the world, something like 40 per cent. There was very good reason to believe that the total amount of gold and silver existing in Europe and America, in the early part of 1848, when the

gold discoveries first came into operation, did not exceed 600,000,000. sterling. Down to the present time there had been added from the new sources of supply—California and Australia—at least 230,000,000. sterling to the former stock; so that the addition was something like 40 per cent. It appeared to be a very startling doctrine to lay down, that at the end of seven years, during which an addition had been made of something like 40 to 50 per cent. to the amount of metallic money prices were somewhat lower. These facts struck very much at the root of those doctrines which had been assumed as almost axiomatic as to the relation of the gold discoveries to the price of commodities. He should be asked were this 230,000,000. of new gold had gone. The gold had been absorbed in increasing incomes, in increasing expenditure, in increasing wages, in increasing commodities, and in increasing dealings. The effect of the new gold has been to apply a stimulus, of which he believed it was impossible to estimate the force, to all industrial enterprise; and the truth was, that those enormous additions had little more than sufficed to meet the increasing demand of metallic money on the part of the civilized portion of the world. The results developed in this country and elsewhere by the crisis of last year, resolved themselves into five conclusions:—First, that throughout the United Kingdom, America, and the North of Europe, and throughout all the great seats of commerce, there had been an excessive speculation in commodities; and if there had been an excessive speculation in commodities there had been an excessive application of capital and credit to deal in those commodities, which were held by parties with a view to making a profit by re-sale within short periods. Secondly, that there had been excessive credit. Thirdly, that there had been excessive advances by banks. Fourthly, that there had been an excessive accumulation of deposits in banks. And it appeared in the fifth place, that one very striking feature in the crisis not only in this country but in America had been the very high rate of interest allowed by banks upon money deposited with them on various conditions. He was disposed to think that principally at the root of the mischief was the excessive application through the medium of banks of quantities of floating capital in the manner he had mentioned, namely, the dealing backwards and forwards in large quantities of commodities under the expectation of making a profit by the re-sale at short periods. The effect of the high rates of interest allowed upon money deposited in banks was to derange the whole of the sound commercial state of the country. Referring to the changes taking place in the gold colonies, Mr. Newmarch said the prices of the leading commodities in Victoria had now fallen about double of what they were here, but there had been no corresponding fall in the wages of labour there. The class in Victoria who had derived the largest amount of advantage from the gold discoveries was not the superior class, but really the class of labourers, whose remuneration had been raised; and the same thing had been felt where the new gold had been brought into operation. He might be asked whether, after the gold discoveries which had taken place in Vancouver Island and the undiminished amount of gold we were receiving from Australia and California, it was not now certain that the time had come when fixed incomes would be affected? He was very much disposed to believe that taking the impetus which had been imparted already to the industrial organization of the great commercial countries of the world,—taking that in connexion with the strides that were making every day in the application of science, it would be found that during the next few years, as it had been found during the last six or seven years, the apprehensions of those persons who believed that fixed incomes would be affected would not be realized.

'An Examination of the Influence of Over-crowding and Density of Population, in producing Phthisis and Diseases of the Respiratory Organs, applied to the Solution of some Questions discussed in the recent Report of the Sanitary Condition of the Army,' by Mr. F. G. P. NEISON.

SECTION G.—MECHANICAL SCIENCE.

President.—W. FAIRBAIRN.

Vice-Presidents.—J. G. APPEL, Sir P. FAIRBAIRN, THE MAYOR OF LEEDS, J. G. GYNN, J. KITSON, Prof. RANKINE, G. RENNIE, J. SCOTT RUSSELL, T. W. WATSON, General WILSON.
Secretaries.—J. C. DENNIS, I. DIXON, H. WRIGHT.
Committee.—C. Atherton, W. H. Bartholomew, J. O. Butler, J. Buckton, C. Breckridg, F. W. Barlow, H. Conybeare, G. E. Donisthorpe, J. Elder, M. I. E. S., J. Elder, C. E. A. Henderson, Col. James, Dr. Joule, J. Kitson, Junr., J. W. Leather, J. T. Leather, J. R. McConnell, R. Mallet, C. May, W. Murray, J. R. Napier, W. Neilson, J. Oldham, R. Roberts, C. R. Robinson, W. Smith, T. Sopwith, W. S. Ward, F. M. Young.

Mr. W. FAIRBAIRN reviewed the progress of mechanical science.—In mechanical science and general engineering this country continues to maintain its high position. Malleable iron, now applied to the construction of bridges, was capable of great development, and there was no span between the limit of one thousand feet which might not be compassed by the hollow girder bridge. With respect to steam navigation much remained to be done, with the object of giving uniformity of strength and security of construction. The *Leviathan*, with all her misfortunes, was a magnificent specimen of naval architecture, the cellular system so judiciously introduced by Mr. Brunel being her great source of strength. He was so persuaded of the security of the principle upon which she had been constructed, that he had no doubt she would stand the test of being suspended upon the two extreme points of stem and stern, with all her machinery on board, or she might be poised upon a point in the middle, like a scale-beam, without fracture or injury to the material of which she is composed. He expressed the hope that the necessary funds would be forthcoming to complete her equipment, and that we should then see her dashing aside the surge of the Atlantic at a speed of eighteen to twenty knots an hour. In this country we have now 9,500 miles of railway, and taking at a rough calculation one locomotive engine with a force of 200 horses power to every three miles of railway, and assuming each to run 120 miles per day, we might thence calculate the distance travelled over by trains to be equal to 380,000 miles per day, or 138,000,000 miles per annum. To transport these trains required a force equivalent to 200,000 horses in constant operation throughout the year. In the locomotive engine there has been no improvement of consequence during the last two years, excepting only its adaptation to burning coal instead of coke; but in the formation of the permanent way considerable improvements had been effected, especially in the jointing of the rails by the process known as fish-jointing. Referring to manufactures, he attributed the depression existing in many branches to the disturbed state of India and China, and with these exceptions, believed that the manufactures of this country were never in a more flourishing condition. The iron trade, which had been similarly depressed, had witnessed many improvements, such as the improved process by which malleable iron and steel was now produced, and the manufacture of steel bars and plates without the intervention of an intermediate and tedious process. A reference to the improved machinery now demanded for purposes of agriculture, and to the consummation of telegraphic communication between the Old and the New World, terminated the address.

'On the Loss of Ships at Sea,' by Mr. J. OLDHAM.—To remedy, in some measure, the dreadful suspense into which multitudes are thrown by ships missing, a gentleman, John Gresham, Esq., proposed that every vessel should be provided with one or more copper buoys bearing her name and the port to which she belongs; that these buoys should also have an Admiralty mark, and a Board of Trade number; and that each should be provided with a chamber with a small spring valve made to open outwards, and capable of resisting any pressure, which should be used for receiving letters, or even treasure, so that if the ship were lost the buoy would float off in safety, and the information it contained would be communicated to the parties interested by any ship which might pick it up. The buoy was intended to be made of strong copper painted in bright red and white stripes, and to be fitted with a small bell and flag on the upper part.

'On the Economy of Water Power,' by Mr. J. GLYNN.

'On the Construction of Floating and Fixed Batteries,' by Mr. G. RENNIE.—It was now some years, he said, since the covering of the exterior of vessels of war with plates of iron was proposed by General Paixhans, of the French Artillery. This he exposed in his work, and stated that to enable a plate to resist a 32 lb. shot, it would require a thickness of several inches, and that from the great weight of the plates it was only applicable to ships of the line, and that at a cost of 24,000*l.* On the commencement of the late Russian war, the Emperor of the French, who had paid much attention to the subject, brought it before our Government. He considered it would very much facilitate the operations then about to take place against the Russian fortresses of Bomarsund, Helsingfors, Sveaborg and Cronstadt. Vessels of great burden and strength were therefore constructed and covered with massive wrought iron plates of four and five inches in thickness. The results of the few trials which were made with these iron-plated batteries were published in the journals of the day, but their success was considered to be doubtful. Many experiments of solid and hollow shot fired from 68 lb. guns have been made recently at Woolwich and Portsmouth, with unfavourable results. These results led the author to think that little or no success had hitherto been attained. He therefore proposed to use inclined or curved surfaces, instead of flat or point blank surfaces, as was illustrated in the models exhibited. One of these was a floating battery, or man-of-war, having its sides cased with iron plates with curved surfaces; the other of a fixed or floating battery, also with curved surfaces. He claimed no other originality for this idea than in the curved forms of the plates. Mr. Rennie also exhibited various specimens of felt which had been handed to him by General Sir Charles Shaw, and several of which had been penetrated to a limited extent by rifle balls.

Capt. FISHBURNE was of opinion that with such an extreme weight of iron it would be impracticable to build sea-going ships. The rapidity of the motion of the *Agamemnon*, when she had the cable on board, had the effect of nearly disintegrating the ship, and she must have had an enormous strain upon her when she suffered in the way that had been already publicly described. The principle advocated by Mr. Rennie could only, he was afraid, be used in exceptional cases.—Mr. SCOTT RUSSELL said the French Government were carrying on a series of experiments, as were also the English Government, but although he had been informed of the nature of these experiments, he was not at liberty at present to communicate them. The English Government were adopting a very wise and judicious course—they were making their experiments now before they built their ships. The point with which, as mechanical men, they had to do, was whether wooden vessels of war were equal to the work of iron vessels. If the English Government found that war ships would be more advantageously constructed with shot-proof sides and otherwise protected with iron, then he had no doubt that engineers and ship-builders would be found who would both get the material and construct the vessel in a proper manner. And he was also of opinion, that it was possible to make ships with shot-proof sides, which would have also good weatherly qualities.—After some further discussion, the CHAIRMAN, in summing up, said that the Admiralty some fifteen years ago had decided against iron ships in consequence of the experiments they then made.

'On the Performance of Steam-Vessels, the Functions of the Screw, and the Relation of its Diameter and Pitch to the Form of the Vessel,' by Admiral MOORSOM.

'On the Submersion of Telegraph Cables,' by Mr. J. MACLEAN.

'On the Recent Improvements in Railway Signals,' by Mr. C. F. WHITWORTH.—Mr. Whitworth exhibited two models. One of those represented a line of rails in the neighbourhood of a station with the distant signal. By slightly inclining a particular pair of rails, and fixing a communication between them and the signals, the train announces itself as soon as it passes over the per-

manent way, and the signal, exhibited for the information of succeeding engine-drivers, announces that a train has just passed, and that it would be dangerous for them to continue their journey until the obstruction is removed. Mr. Whitworth also exhibited a model of a railway signal intended to be attended by an ordinary signal-man. The new principle in it was the use of a wheel instead of a lever. This wheel, like the wheel of a vessel, moved the arms of the signal, and registered the fact of its having done so by ringing a bell both at the station and at the wheel itself. In misty weather, consequently, the signal-man would be perfectly aware he had discharged his duty, and when the proper signal was displayed.

FINE ARTS

FINE-ART GOSSIP.—The Bordin Prize, for a 'History of Sculpture and Ornamental Art in France from the Sixth Century to the End of the Reign of Louis the Fourteenth,' has been awarded by the Academy of Fine Arts to M. Henri Descamps. —The first prize for Architecture was obtained by M. Coquard, of Paris, a pupil of M. Lebas, —and the second by M. Thierry, of Paris, a pupil of MM. Thierry and Lebas.

Geefs's colossal model of his statue representing the Liberty of the Press has arrived, not without difficulty, from Antwerp, at Liège, where the casting will take place under the superintendence of the above-named artist. When completed, the bronze statue will occupy one of the four angles of the "Congress Column" at Brussels. Special trucks were obliged to be constructed for the carriage of the model to enable it to pass safely through the various tunnels between Antwerp and Liège.

A Correspondent writes:—"We have just returned from Fonthill, the former residence of that crackbrained voluptuary, epicure, and *dilettante*, Vathek Beckford. A small wing of the great Pandemonium of old china, books, and pictures remains. This, I do not think, is generally known. It stands on a slope far above the great mansion which the present part-owner of Fonthill, the Marquis of Westminster, is building, and in a far finer and more tasteful position. The old house looked out on ranges of Wiltshire down, and the owner's eye could reach as far as Lansdown from the towers. The new Edward-the-First, Scotch *château* sort of house is sunk in a sort of earth pool, buried in woods, and hid from everything. Beckford is still remembered for his generousities, caprices, and madneses. An old man who had worked for him told us that the novelist used to call Sunday 'Fools' Day'; and that if he took a dislike to a workman, unless the man were hidden or removed for a time, while the Ahab fit lasted, his master would never rest till he hounded him from the place. It is melancholy to see the old nine-mile drive chopped into parts of three estates,—to see the drives and terraces grass-grown and untrodden, the fine Inigo Jones gateway now leading to a stranger's hall, and the small remains of the King Edward's gallery turned into a place for noisy, merry, but thoughtless pic-nics. The new house, though rich, we cannot say much for: it is hard, dry, cumbrous, and three-cornered. The entrance, all over scutcheons, like a title-page to Burke's Peerage, is put out of the way. There is no great hospitable hall, with large-hearted chimney-piece,—there are pepper-box turrets leading nowhere,—half the house is servants' offices,—and, to crown all, there is no view. The architects are Scotch, the style is Scotch, and the originator of this pit for a million is all over Scotch. Wiltshire, that runs over with beauty, and has downs like prairies, never suffered from such a stone nightmare as this before.

"G. W. T."

We have again to notice, with praise and pleasure, more numbers of Messrs. Maul & Polyblank's photographic portraits of living celebrities. Though not the most brilliant, we are inclined to think these portraits are the most practical and serviceable of any issued, though they do not approach those of Mr. Herbert Watkins in daring, breadth or size. Those of Mr. Watkins's lenses seem to bring you nearer the men than those we now

review. Accurate, neat and exact as they are, it is one of the Art-luxuries of this favoured and growing age, that we have such remembrances as these—of great small men, small great men, and great great men before they die, and the fat sluggish tide of oblivion or neglect sets in dead against their memories. This is not only a pleasure and a satisfaction to curiosity, but a positive gain to history. It secures accuracy, for we can now refute the careless or strabismic oil-painter by the all-but-infallible photograph. Besides, it diminishes the number of great men who die leaving no portrait. Who that believes in the correspondence of body and mind, does not move old memories or the treasured curl of a dead love, and has not regretted that we have no real portraits of Shakspeare, of Chaucer, of Wallace, of Tamerlane, of Savonarola, of Bruce, of Homer—that the portraits of such men too as Rabelais, Boccaccio and Ariosto should be worse than doubtful? Who that knows the carelessness, the haste, the born-blindness of portrait painters can believe all or almost any portraits. Remember the ravages of time on colour and outline. Remember the mistakes of catalogues, wilful and accidental; the numberless and endless frauds of dealers; the disarrangements and transpositions of knavery and accident. How certain we feel at a Bond Street sale, that the "valuable portrait of Sir Richard Bogygriffin" was once "an original portrait of Sir Philip Sidney," and before that "Don John of Austria," or "the poet Waller." It all turns on an illegible "label in the left-hand" corner, inserted and browned by the Westminster oven-man ten years ago. So thank Heaven, ye historians, for lie-hating photography, that has cried "Let there be light," and there is light,—and will be more. Here is Dr. Livingstone, with the inevitable table and damask table-cloth, common, very common to photographer's rooms, holding awkwardly and ludicrously enough the twin horns of the greater antelope (evidently the origin of the ancient Greek lyre, by-the-bye),—sharp, thick, and strong, they form a sort of horny mitre in his hand. The plaid trousers beautifully indicate the national taste of the brave son of the poor Scotch tea-dealer, whose dealing is with savages, fevers, and rushing lions. The fine, rugged resistance of his face is excellently given, with its protruding brow, rude cleft chin, keen, shrewd eyes, and stubborn suffering face, Titanic and scarred as it is. Thank God! the mould of our old doers and sufferers is not yet broken. Next him, in due parliamentary attitude, comes that acute son of a Liverpool merchant, Mr. Gladstone, right honourable and right sophistical. The unwrinkled fall of his dark frock-coat is perfect—so is the manly swathe of his broad white waistcoat—so the gentlemanly set of his neat, shepherd's plaid trousers. The wilful twist of his neckcloth, not perfect enough to have secured Brummel's admiration, is finely characteristic—the twisting roll of it is an argument, the impatient knot a snappish epigram. If a public man chooses to sit for a photograph, that will be sold by thousands, he must expect that likeness, which his vanity or good nature chooses to make public, to be criticized. The full, straining forehead, the vexed eyes, the lined face, the thin, working lips are true, and like the keen, subtle fencer of St. Stephen's. Next comes Alison, the laborious writer, whose great works (as heavy as they are great) it is so laborious a task to read. The unknown organist's son, now a great musician, the pupil of Mendelssohn, Dr. Sterndale Bennett, is grave, formal and solemn as any Methodist-saint mounting the pulpit with the intention of anything but trifling away an hour. Only one of our great artists can approach this great musician, to judge by his portrait, for cold gravity. How deep the heart must lie that composed the delicious, tender gracefulness of 'The Mill-stream and the Fountain.' The brow is twitched painfully, as if struggling with nervous thought. Not so that of The Earl of Aberdeen, the contemporary at Harrow of Peel, Byron, and Lord Palmerston, who, with pumpkin upper-lip, long and heavy, seems receptive and patient enough for any ministerial work. Cautious, laborious and heavy are those small eyes, that high round skull, that puckered face, the long, smooth, waved hair; the

deep pouches under the eye, and the ruled forehead show age. Last of all, in careless, easy paletot and loose collar, comes that Scotch-Irish poet-painter MacLise,—"Another Daniel come to judgment,"—frank, free, and somewhat defiant of face,—with bold, teeming, full forehead, intense eyes, and compressed and somewhat sour mouth. Now, if these personal remarks offend the gentlemen who have just published their faces to a critical world, which is no respecter of persons, they have only themselves to blame. They come to us, throw themselves into attitudes, and must not complain if the public notice that this beaming eye squints, and that meaty mouth is awry.

MUSIC AND THE DRAMA

MR. and MRS. HOWARD PAULS' Comic Musical, and Fanciful Drawing-room Entertainment, "PITCHWORK," at the EGYPTIAN HALL, EVERY EVENING, at Eight. A change of Programme next week, with "Come into the Garden, Maid." Saturday Mornings at Three—Stalls, 2s.; Area, 1s.; Gallery, 1s. No extra for booking places. The Salts is awry decorated.

SURREY.—The new drama produced on Monday, and entitled 'The Branded Race,' is not, as might from the title have been expected, a vehement melo-drama, but a new blank-verse tragedy in three acts, in which a Hebrew having exercised the highest offices of the State in Castile under the guise of a Christian, is at last detected in his unlawful assumptions, and, notwithstanding his virtues and services, denuded of his authority, robbed of his daughter, and persecuted to the death. Mr. Creswick enacts the hero, and has, in the course of the piece, but particularly in the last act, to advocate the cause of the Jew, whose benefits to the race are set forth at large, and argumentatively enforced. The speeches needed in support of this theme somewhat dangerously delayed the catastrophe;—but Mr. Creswick manfully delivered them, and gained repeated applause. The dialogue is very neatly written, and a certain air of elegance pervades the composition. The stage appointments, together with the scenery, are costly and picturesque.

Another new piece in two acts, called 'Harold Hawk,' succeeded. This is a decided melo-drama, of which Mr. Shepherd is the hero. Both are of the genuine transpontine character. The son of the village is a rejected lover, and swears vengeance against his successful rival. In the second act, all the parties to the first find themselves in Australia. Here *Harold Hawk* has an opportunity of avenging his supposed wrongs. The heroine, now married, is left in a lone hut by her husband, and Harold, as an escaped convict, obtains admission. Food and brandy at his request are supplied to him; after which, failing to induce the lady to elope, he meditates her assassination, after having rifled the bureau of its deposits. The knife, however, drops from his hand; when he determines on strangling her, and observing a rope and a ladder, climbs to the rafters and appends the former to a beam. While making the noose, it slips over his wrist, and the ladder falls, so that the ruffian hangs there by one arm. In this condition he is found by the husband on his return with a party of soldiers, who take him into custody. And thus ends the career of Harold Hawk. We perceive nothing in his adventures to justify their having been dramatized.

A third piece, called 'What's your Game?'—a comedietta—was also produced—a noisy affair, answering the obvious purpose of sending away the audience in a merry mood.

A new drop-curtain, by Mr. Dalby—representing foldings of white satin—is added to the embellishments of the house.

OLYMPIC.—We meet here with another example of Mr. Wooller's dramatic talent—not a tragic drama, but a farce, entitled 'A Tale twice told.' Though not tragic, however, the elements of the fable are derived from a tragic plot, and repeat, in a comic form, the old story of Athelwold and Elfrida. The former is translated into one *Barnacle Brezely*, represented, very cleverly, by Mr. Lewis Ball, and King Edgar is degraded to Mr. Percy Gauntlett (Mr. Walter Gordon). This

kind of adaptation of an old tragic chronicle to the purposes of farce, partakes rather too much, of burlesque. Of course, to bring about the dénouement, Mr. Percy Gauntlett, with or without motive, must pay a visit to the newly married couple. Whereupon Mr. Breezely puts forward a friend, a supposed *Miss Mannerly* (Miss Hughes), as the substitute for his real wife; and Mr. Gauntlett, pre-advised of his trick, maliciously courts Mrs. Breezely herself. The husband suffers from jealousy, but consoles himself with brandy. To crown the extravagance, Gauntlett is already married to Miss Mannerly, and thus the solution is rendered easy enough. Such an interest is, of course, the slightest; but it is sufficient for the support of a drawing-room play, and the piece was moderately successful.

STRAND.—Mr. Charles Selby is the author of another new piece at this theatre, 'My Aunt's Husband.' The plot is founded on the secret marriage of *Capt. Touchwood* (Mr. Swanborough) with a rich widow lady (Mrs. Leigh Murray), whose late husband had by his will debarred her from a second marriage. The fact of their being only lovers, however, is doubted by *Mrs. Moulsey Mifflins* (Mrs. Selby), a mischievous old lady, who spreads her suspicions wherever she goes. They reach even the ears of *Mr. Nettletop* (Mr. W. Mowbray) and his wife (Miss E. Wilton), who are really the parties to be benefited under the will, in case of its conditions being violated. The Touchwoods are accordingly put on the defensive, and call in the aid of the footman, *Samuel Sniggers* (Mr. J. Clarke), who assumes female attire and pretends to be the Captain's lady. With this the comic, or rather the farcical sport of the drama begins. It will easily be conceived that Mr. Clarke is extravagant enough; but the author has furnished him with motive for extravagance,—such being the excess of his glee at the success of his scheme, that the latter becomes easily transparent to the interested Nettletops. To escape from the dilemma thus caused, the author has found it necessary to provide a second will, which in turn is found by those who want it on the stage at the needful time, and which leaves the threatened lady free to contract a second marriage. A more meagre invention can scarcely be conceived. But so well is the little drama performed, and particularly in reference to the shabby-minded and shabby-looking Mrs. Mifflins, that it was greatly successful. The triumph is certainly owing to Mrs. Selby's most artistic assumption, not only of character, but of costume.

MUSICAL AND DRAMATIC GOSSIP.—'A Winter's Tale' has been revived at Sadler's Wells, and gives opportunity for a new actress in the part of *Perdita*. Miss G. Egerton is a young lady of considerable promise, but at present too demonstrative.

The Princess's Theatre re-opens this evening, which commences "the farewell season" of Mr. Charles Kean's management. 'The Merchant of Venice' leads off the series of intended performances,—each of which it is purposed to continue for a fortnight. In addition to these, a new revival will be produced,—we believe, the Shakspearian historical play of 'Henry the Fifth.'

Mr. Leigh Murray appeared on Thursday week at the Lyceum, as the hero of the new comedy of 'Extremes,' which is certainly benefited by his assumption of the character.

The German journals report the success of a patriotic drama, 'Das Testament des grossen Kurfürsten' ('The Will of the great Elector'), by Baron G. zu Putlitz. It has met with an enthusiastic reception at Vienna, as well as at Berlin; and its fundamental idea that Austria is to be the shield, and Prussia the sword of Germany, seems to give great satisfaction to both Austrian and Prussian hearts.—Another interesting novelty on the German stage is a comedy by the young poet, Dr. Julius Rodenberg. It is entitled 'Ehen werden im Himmel geschlossen' ('Matches are made in Heaven'), and has been represented, with great applause, at Weimar, Frankfort-on-the-Maine, and Munich.

MISCELLANEA

Museum Reading-Room.—As the absence of a reply to "Alphabeta's" letter might lead your readers to suppose that the class which he stigmatizes acquiesces in his censure, you will not, perhaps, refuse insertion to the following remarks by one who belongs to that class. The objections of "Alphabeta" to our admission are, as I understand, three: that we abuse our privilege by an improper method of study; that there are other institutions better fitted to supply our wants, and that we disturb the better sort of readers by incessant conversation. Upon the first of these I will not enlarge; because I think that, if proved, it would not materially strengthen your Correspondent's position. But I may as well remark that the use of translations is approved of by some of our first classical scholars. The second objection is more serious; and, were it well founded, would deserve to be fatal. But, unfortunately, most college libraries are sadly deficient in the works—classical, mathematical and scientific—necessary to a tolerably intelligent student, even though he be under eighteen years of age. The existence of a most annoying "undercurrent" of trivial conversation, I, an unwilling victim, am the last to deny; but it is by no means confined to the young and "unlearned." The class of readers, however, to which "Alphabeta" belongs can very easily put a stop to this (and I heartily wish that they would) by simply requesting us to be silent; a remedy which, as conveying a reproof, the modesty of youth forbids us to employ towards them. I am often inclined to wonder whether those denizens of Parnassus, who write and talk so contemptuously about us, and dart glances so withering at the unhappy haunters of the portion of the Library sacred to Bohn (candidates for the Civil Service, perhaps, or tremulous undergraduates), were ever at the bottom of the hill; or how they climbed it; or whether they, in their youth, were subjected to the exclusive and unsympathizing system which they would enforce upon us.

PSIOMEGA.

Sept. 27.
Visitors to Royal Palaces and Galleries.—In 1857 26,103 persons visited the state rooms of Windsor Castle; 126,898 the New Houses of Parliament, more properly called the "New Palace of Westminster"; 173,710 Hampton Court Palace; 631,034 the general collections of the British Museum in Great Russell Street; 94,370 the Museum Reading-room, as students; 640,850 the National Gallery; 250,770 the Vernon Collection in Marlborough House; 284,953 the Kensington Museum; 17,197 the Museum of Practical Geology; 114,195 the Tower; 361,798 the Gardens at Kew; 50,557 the "Painted Hall" of Greenwich Hospital (which, as Lord Macaulay reminds his readers, was virtually founded by "good" Queen Mary, the consort of William the Third, of immortal memory); and 1,676 the Soane Museum. The number of Sunday visitors to the Kew Gardens is immense, no less than 185,599 persons having devoted a portion of the sacred day to a study of its botanical treasures in the year 1857 (against 176,199 on the other days); 176,952 in 1856, and 178,194 in 1855. The number of Sunday visitors always exceeds that of the week-day visitors. The visitors to the British Museum increased from 361,714 in 1856 to 621,034 in 1857,—but this is to be explained by the temporary opening of the new reading-room for the inspection of general visitors; and the number of "readers" or searchers of books has increased from 53,422 to 94,370. The apartments at Hampton Court Palace are open to visitors on Sundays, and the public freely avail themselves of this arrangement of the authorities for recreation.

TO CORRESPONDENTS.—P. R.—A. C.—M. C.—A Student Reader—H. N.—J. S.—B. F. J. B.—H. J.—C. M. W.—W. R.—C.—A. E.—received.

Erratum.—P. 402, col. 3, l. 43, for "Woolmer" read Woolner.

A paragraph quoted by us from the *Photographic News* (ante p. 370) was, by a slip of the pen, accredited to the *Photographic Journal*. We willingly correct the slip, and thank the Correspondent who points it out.

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